

ELIET[®]

MANUAL

UltraProf



This booklet contains information for proper use and maintenance of the machine. **Read it carefully and store it in a safe place.**



Please **retain your sales invoice** or receipt copy along with this booklet.



Register your purchase online at **www.elieta.eu** (active from September 2008). Before you need to return the filled-in warranty form to Eliet Europe NV).



Since Eliet is a Belgian company, all **measurements are shown in mm, kg and liter**. In Appendix G (p.91) you can find a conversion table with all the necessary data.

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1. Introduction



1.1 Please read the manual

Eliet machines are designed for safe and reliable use if they are operated in accordance with the instructions given. Carefully read these operating instructions before using the machine. Failure to observe this may result in personal injury or damage to the equipment.

1.2 Identification data - ELIET ULTRA PROF

Note the identification data relating to your machine in the boxed areas.

Stock no.:

MA

Serial Number :

Year of Manufacture:

20

2. Warranty



2.1 Warranty card

To be eligible to obtain warranty you must mail the completed warranty card within one month of the date of purchase to the address stated below. You can also register your product online at www.eliet.eu.

European customers

ELIET EUROPE NV

Diesveldstraat 2

B - 8553 Otegem (Belgium)

T +32 56 77 70 88 - **F** +32 56 77 52 13

www.eliet.eu

Read the warranty conditions on the attached warranty card.

US customers:

ELIET USA Inc.

3361 Stafford street (office B)

15204 Pittsburgh (PA)

Phone 412 367 5185 - **Fax** 412 774 1970

www.elietmachines.com

3. Welcome



Welcome to the family of ELIET customers.

We would like to thank you for the confidence that you have placed in ELIET and we are convinced that you have purchased the very best machine. The operating life of your ELIET machine depends to a great extent on how you care for your machine. This operating manual and the motor manual provided will assist you in this respect. If you follow the instructions and suggestions in these manuals, your ELIET machine will operate for a very long time in optimal condition. Read this instruction manual carefully before operating this machine. This will prevent you from operating the device incorrectly.

For your own safety, take into account the safety instructions specified in the relevant chapter. Even if you are thoroughly familiar with operating such equipment, it is still advisable to read these pages carefully.

At ELIET all our machines and devices are subjected to a policy of continuous change and therefore, the specification of your machine may differ slightly in terms of shape, technology and accessories. The descriptions and technical data in this manual are accurate at the time of printing. Certain illustrations and descriptions may not be applicable to your specific machine, but instead relate to a different version of the machine. In turn, we trust that you will understand that the texts and illustrations in this manual cannot lead to any claims.

If you still have any questions after you have read this manual, please contact your ELIET dealer.

ELIET AT YOUR SERVICE

European customers

GMT +1: from 8-12 AM, 13-18 PM

Diesveldstraat 2 **T** +32 56 77 70 88
 B-8553 Otegem **F** +32 56 77 52 13
 Belgium **E** Service@eliet.eu

US customers:

GMT +6: from 08:00 to 18:00

Phone 412 367 5185
Fax 412 774 1970
Email Service@elietmachines.com

Warning



Operating outdoor power equipment

Under the laws of several countries or states you are not permitted to operate an internal combustion engine using hydrocarbon fuels on any forest covered, brush covered or grass covered land or on land covered with grain hay or other flammable agricultural crop, without an engine spark arrester in continuous effective working order.

The engine on your power equipment, like most outdoor power equipment, is an internal combustion engine that burns gasoline, a hydrocarbon fuel. Therefore, your power equipment must be equipped with a spark arrester muffler in continuous effective working order. The spark arrester must be attached to the engine exhaust system in such a manner that flames or heat from the system will not ignite flammable material.

Failure of the owner/operator of the equipment to comply with this regulation is a misdemeanor under certain law (e.g. Californian Law), and may also be a violation of other state and or federal regulations, laws, ordinances, or codes. Contact your local fire marshal or forest service for specific information about what regulations apply in your area.

The standard muffler installed on the ELIET engines is not equipped with a spark arrester. One must be added before use if this machine is intended to be used in an area where a spark arrester is required by law. Contact the local authorities if these laws apply to you. See your authorized engine dealer for spark arrester options.

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5. Safety symbols



Certain symbols in this manual are used to provide additional information and to draw your attention to potential risks.

5.1 For your information



For your information:

This symbol is used to draw your attention to specific information and/or actions, or to denote where you can find additional information relating to the subject.

5.2 Caution



Caution:

This notice identifies safe usage habits. This is done to prevent incorrect actions that can result in personal injury or damage to the machine.

5.3 Warning

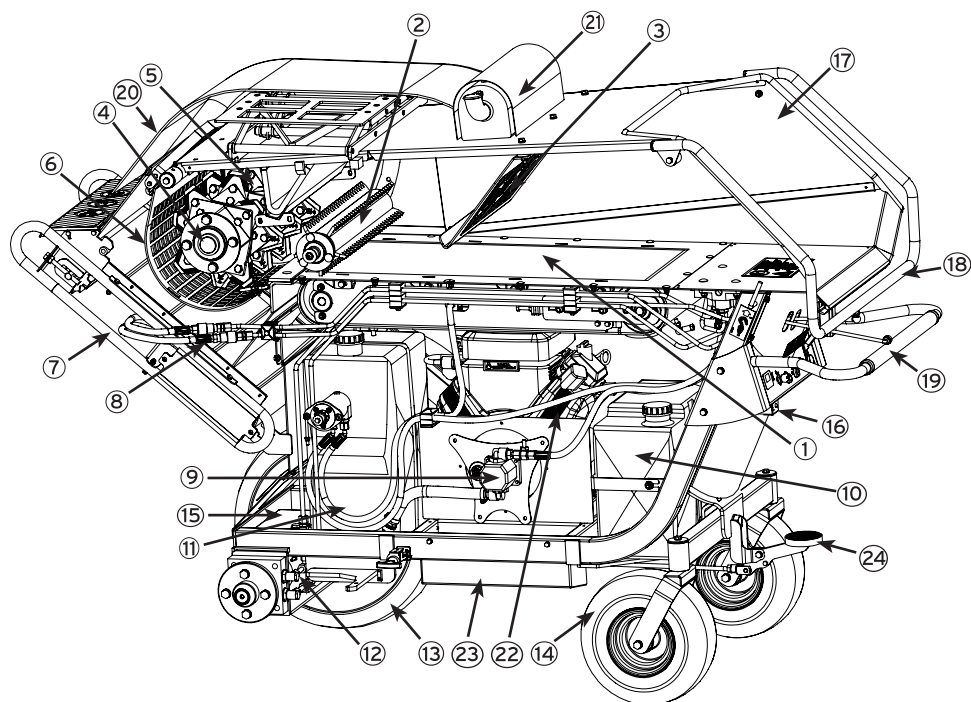


Warning :

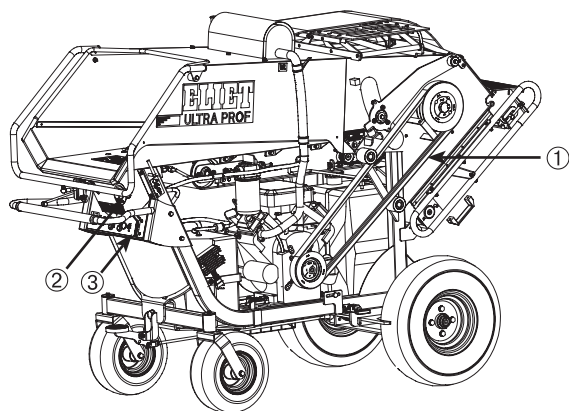
This notice is used to warn you about extreme danger that you must be aware of in these specific circumstances. Thus remain alert, in order to ensure your own safety.

6. Main parts

To fully understand the content of this operator's manual you need to be fully conversant with the terminology used for the descriptions. In this chapter you can find a set of parts identified by name. It is a good idea to take time to study the machine beforehand for an improved understanding of the descriptions provided in this user manual.



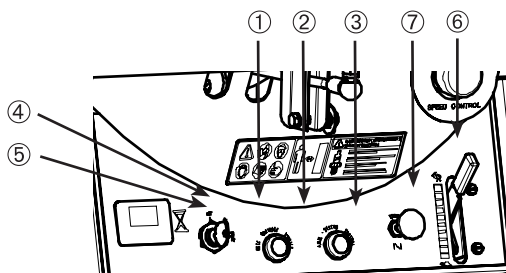
- | | | |
|---|---------------------------|----------------------------|
| 1. feed belt | 9. hydraulic pump | 16. feed control |
| 2. feed roller | 10. fuel tank | 17. handlebar with |
| 3. safety Screen | 11. hydraulic tank | wheel drive control |
| 4. rotor | 12. hydraulic wheel motor | 18. polyester safety guard |
| 5. shredding chamber | 13. driven rear wheels | 19. catalytic converter |
| 6. screen | 14. swivel caster wheel | 20. engine |
| 7. discharge conveyor | 15. battery | 21. cooling air admission |
| 8. discharge conveyor hydraulic quick release couplings | 16. EcoEye™ sensor | 22. parking brake |
| | 17. feed hopper | |



1. belt
2. speed governor
3. display

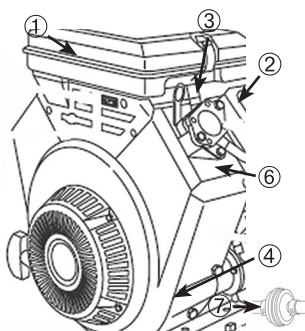
Display:

1. start key
2. oil level warning light
3. ABM indicator light
4. display
5. hours run counter (option)
6. throttle control
7. choke lever

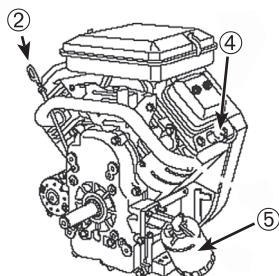


Engines: 670

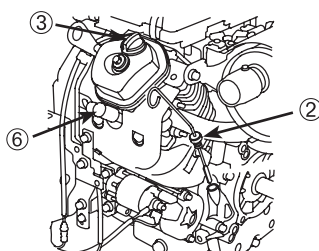
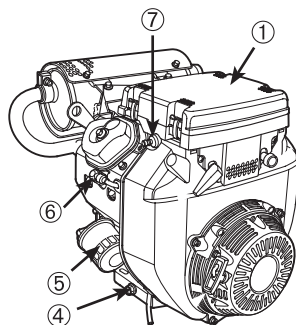
22 hp B&S Vanguard



1. air filter
2. oil gauge
3. oil filler plug
4. oil drain plug
5. oil filter
6. spark plugs
7. fuel filter



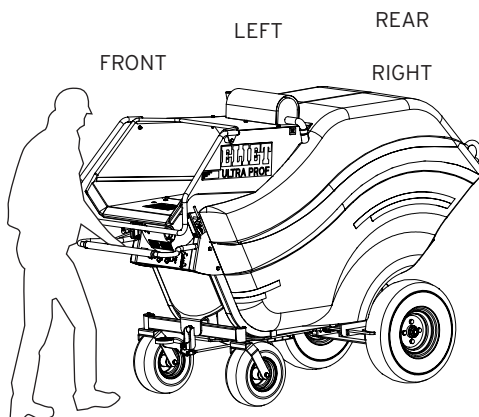
24 hp Honda GX





For your information:

Reference in this manual to right or left hand side, back or front of the unit is observed from the machine operator facing the branch feed.



Regularly visit your authorized ELIET dealer. **Your ELIET dealer is at your service**, ready to provide you with maintenance or advice so that your ELIET machine always remains in optimal condition. You can contact him for **ELIET original spare parts** and lubricants. These service parts are manufactured to the same stringent accuracy requirements and standard of craftsmanship as the original equipment.



For your information:

Chapter 11 lists the required maintenance intervals in a table and provides recommendations regarding which maintenance an authorized dealer should be consulted.



Caution:

For your safety, use only genuine ELIET parts on ELIET machines.

7. Safety regulations

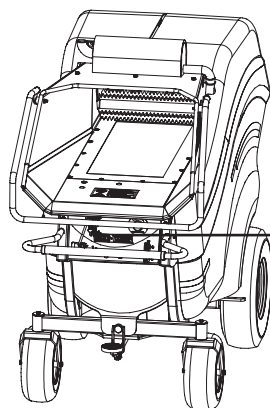
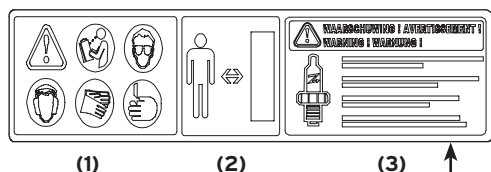


7.1 Safety messages



For your information:

Safety stickers have been affixed on to visible areas of the machine.
Make a note of the warning messages specified on these stickers.



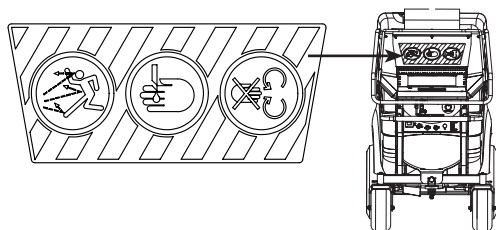
A number of informative sticker can be found just above the instrument panel:
(Art. n° BQ 505 010 171)

Sticker **(1)** uses icons to denote all the general safety regulations.

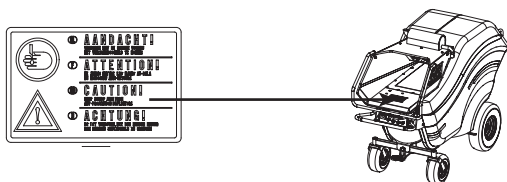
1. Read this user manual carefully in its entirety before attempting to operate this machine.
2. Always wear the appropriate protective garment when operating the machine (protective gloves, safety goggles, hearing protectors).
3. Performing maintenance or operating the machine can be source of hand injuries. Be attentive and careful.

Sticker **(2)** reminds the operator to keep bystanders a safe distance away. The minimum distance from the machine must be respected (10 m).

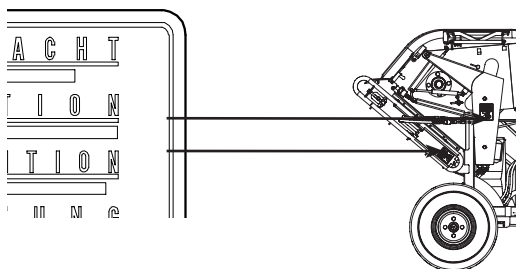
Sticker **(3)** warns the operator or the maintenance engineer to disconnect the ignition cables when performing maintenance work. (Remove the key from the ignition.)



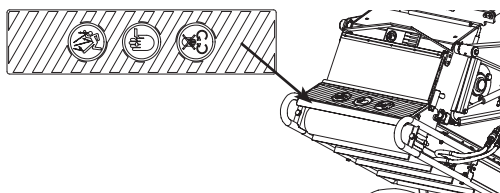
Two eye-catching warning stickers have been added to the feed opening. A sticker has been added to the safety screen and points out a number of risks for the operator using icons: the risk of being pulled inside by the feed mechanisms and the hazard formed by material kickback from the machine as well as other issues. An icon expressly points out the hazard of hands being injured by cutting. (Art. n° BQ 505 010 100)



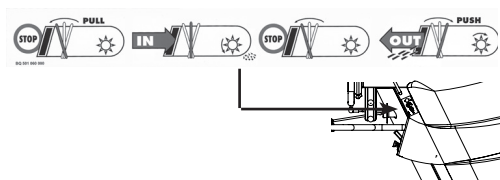
The sticker reminds the user that it is strictly prohibited to place his hands past the safety screen to ensure that all injuries can be prevented. (Art. n° BQ 505 010 110)



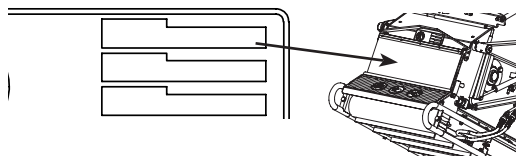
This sticker can be found where the belt drive is located and on the chain guard of the feed roller and on the feed belt and discharge conveyor. They point out the hazard represented by a chain or belt drive. It is strictly forbidden to operate the machine with the safety guards removed or open. (Art. n° BQ 505 010 130)



This sticker can be found on the discharge conveyor on the rear of the machine. An icon instructs the user not to put hands in the discharge opening. A real hazard of having your hands cut exists here. There is also a danger of being wounded due to material kickback on the discharge side. An icon reminds bystanders to keep a safe distance (10 m). (Art. n° BQ 501 200 170)



This sticker can be found on both sides of the feeding hopper and is a reminder for the operator when operating the feed hopper control handle. (Out - Stop - In - Stop) (Art. n° BQ 501 200 150 & BQ 501 200 160)



This sticker is affixed to the back of the machine at the discharge chute for the chippings. This sticker reminds the user of the machine to examine the bolts retaining the blades for security of fixings within the 5-hour bedding-in period of fitting new blades or reversing existing blades.

(Art. n° BQ 505 010 160)



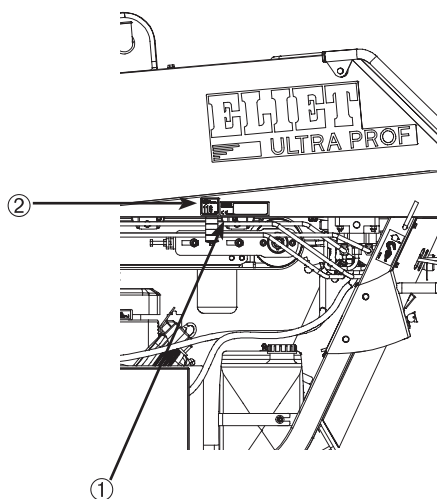
This sticker is near the catalyst and exhaust manifold. It warns against muffler elements that may cause burns when touched.

(Art. n° BQ 505 010 060)



This sticker can be found on the bottom of the left safety guard. It reminds the operator to leave the suction side of the cooling air for the engine unobstructed.

(Art. n° BQ 505 010 340)



This sticker **(1)** is located on the side of the feeding hopper. It lists all the identification data relating to the machine:

- Model
- Model number
- Serial number
- Year of Manufacture
- Engine
- Power
- Weight
- Guaranteed A-weighted sound power level Lw(A)

This sticker also lists the manufacturer's details. The CE label means that the machine complies with the governing European machinery directive.

This sticker **(2)** is located on the side of the feeding hopper. The legend specifies the guaranteed A-weighted sound power level Lw(A) from the machine under standardised conditions.



Caution:

Safety stickers becoming damaged, illegible or removed through use or cleaning, must be immediately renewed. Stickers are available at your approved ELIET Dealer.

CAUTION

- 1/ Do not interfere with the Owners Manual before attempting to operate this equipment.
- 2/ Before starting the machine, check that all screws, nuts, bolts and other fasteners are properly secured, make certain that the cutting chamber is empty. Do not operate without guards or screens in place.
- 3/ Do not support this machine while the engine is running.
- 4/ Before inspecting or servicing any part of the machine, shut off power source. Disconnect the spark plug wire from the spark plug and make sure all moving parts have come to a complete stop.
- 5/ Never operate this machine indoors.
- 6/ Operate the machine only on a level surface. Keep proper balance and footing at all times. Do not operate machine on a paved or gravel surface.
- 7/ Carbon Monoxide can be extremely dangerous in enclosed areas. Do not run the machine in an enclosed area since the exhaust from the engine contains carbon monoxide.
- 8/ Do not allow children to operate this equipment. Do not operate this equipment in the vicinity of buildings.
- 9/ Maintain wear safety glasses at all times while operating machine.
- 10/ Do not allow hands or any other part of the body or clothing inside the feeding chamber, discharge chute, or near any moving part.
- 11/ Obtain and wear safety glasses, gloves and hearing protectors at all times while operating the machine.
- 12/ Avoid wearing loose-fitting clothing.
- 13/ Always stand clear of the discharge area when operating this machine. Keep face and body back from the feed opening.
- 14/ When loading shreddable material into the equipment be extremely careful that pieces of metal, nails, bottles, cans or other foreign objects are not included.
- 15/ If the cutting mechanism strikes any foreign object, or if the machine should start making any unusual noise or vibration, immediately shut off the engine and allow the machine to stop. Disconnect the spark plug wire from the spark plug and take the following steps:
 - 1/ Respect for damage
 - 2/ Replace or repair any damaged parts
 - 3/ Check for and tighten any loose parts
- 16/ Do not allow processed material to build up in the feeding opening.
- 17/ If the machine becomes clogged, shut off the engine (or motor), disconnect the spark plug wire and allow machine to come to a complete stop before clearing debris.
- 18/ Keep the engine clear of debris and other accumulations. Do not tamper with engine governor settings.

(1)

These stickers (1) (decals) apply exclusively to our American Customers: This sticker summarizes in 18 items a number of important safety messages taken from the user manual. Caution: However, this does not imply that there's no need to read the manual. (Art. n°: BQ 505 010 200)

This sticker (2) is located on the battery holder. It warns the user of the potential hazards of battery acid. (Art. n°: BQ 505 010 180)



(2)

This sticker (3) is located on the feeding hopper at the feed opening. It reminds the user to operate the unit observing the stated capacity. (Art. n°: BQ 505 010 190)



(3)

This sticker (4) is located near the engine starter mechanism. Each time the machine is started, the operator is reminded to inspect and service the blades before turning on the machine. (Art. n°: BQ 505 010 250)



(4)

This sticker (5) is found near the identification sticker. Here, our American customers will find the phone number for technical support in case of problems. (Art. n° BQ 505 010 240)



(5)

7.2 Safety provisions

- **Rugged construction:**

The robust construction not only adds to the long operating life of the machine, but also provides additional user safety whenever there is an unforeseen emergency.

- **Safety handle (1):**

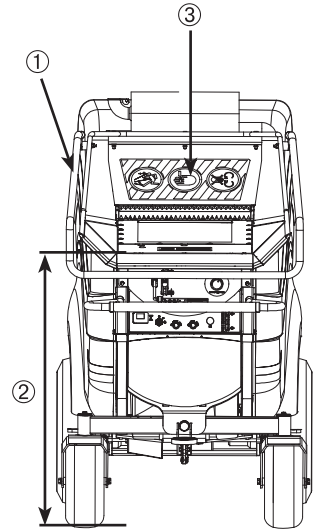
You can operate the feed of the machine with this control lever. When pressing this control lever completely towards the machine, every feeding mechanism will be interrupted.

- **Safe feed-in height (2):**

The hopper has been designed with a 1,000 mm feed-in height and the dimensions of the feeding hopper are such that it acts as a natural barrier to being pulled into the machine unintentionally.

- **Safety screen (3):**

The steel safety screen in the feeding hopper protects the operator against kickback material. Any attempt by the operator to insert his hands beyond this steel sheet is strictly forbidden.

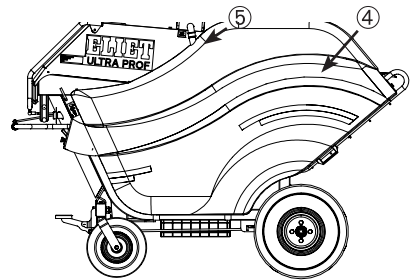


- **Sound absorption (4):**

The acoustic housing accommodating the engine and the shredding chamber gives excellent noise reduction whilst shredding, therefore, minimising noise nuisance for both the operator and the surroundings.

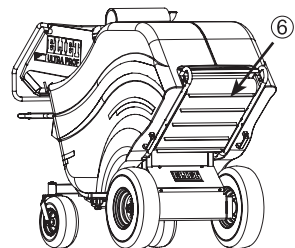
- **Exhaust catalyst (5):**

The catalyst filters the exhaust fumes from the engine to a far-reaching degree which minimises air contamination for the operator and the environment.



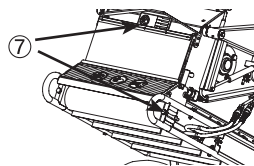
- **Safe discharge system (6):**

The system that ELIET has decided to use to discharge chippings is safe and ensures that chippings cannot leave the machine at speed or violently. This will minimise the risk that this may wound someone or that damage is caused to objects within the immediate operating environment. A safety switch will stop anyone from putting the machine into operation without first having installed the discharge belt conveyor.



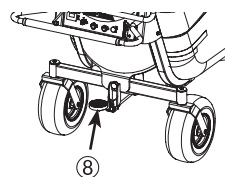
- **Shielding panels with safety switches (7):**

The large shielding panels hide all moving parts against involuntary contact. When one of these shielding panels is opened, the machine will be immediately switched off.



- **Parking brake (8):**

The parking brake will lock the machine in its position whilst working or transporting material. This ensures that there cannot be any unforeseen situations where the machine starts to move unintentionally.



- **Safety wear:**

For your safety, we strongly recommend to use the safety kit supplied as standard. It contains your Personal Protective Equipment (PPE). This safety set consists of safety glasses, ear defenders and a pair of riggers gloves.

7.3 Safety instructions

7.3.1 General safety instructions

- The Owner Manual must stay with the unit during its complete service life. It serves as a reference for the user, and enables the machine to be used and maintained in accordance with the correct instructions. Always refer to this instruction manual if you have any doubts about an action that you are about to perform.
- Always observe the applicable regulations of the Labour Inspectorate to avoid accidents.
- If the instructions stated in this manual are not clear to you, do not hesitate to contact your Eliet dealer for further explanation. ELIET's helpdesk will also be at your service during office hours to answer your questions (EU +32 56 77 70 88 - USA & Canada +1 412 367 5185).
- Read the chapter meant for the dealer (read § 8; p. 23) and immediately verify whether the machine has been delivered in accordance with the instructions.
- Carefully observe all safety instructions when using the ELIET machine ! Carefully read all the instructions relating to the use of the machine. All these instructions relate to your personal safety.
- When you purchase the machine, first allow the dealer or a professional to give you some instruction.
- Read and observe all safety messages posted on the machine in the form of stickers.
- Read and observe all safety messages posted on the engine.
- Also read the safety instructions of the engine manual.
- Under no conditions whatsoever may the original design of the machine be modified without written consent of Eliet.

7.3.2 Careful and security-conscious use

- This machine is designed solely for shredding branchy material, prunings, leaves and all kinds of organic garden debris. Any use other than the designated operation is at the risk and responsibility of the operator.
- As shredding involves ongoing considerable physical effort, take regular breaks for food intake, rest and drinking.
- It is unsafe for persons suffering heart problems and/or having balance disturbances to operate the machine.
- Think about what you are doing whenever you operate the machine. Do not be tempted to let routine dull your attention. Never act impulsively or in reflex.
- Despite the extensive safety features, do not seek out dangerous situations. (The appendix contains an indicative list of dangers. Please read it.)
- Never attempt to shred branches that are frozen.
- Take care to preclude any tools falling into the in-feed funnel.
- You must never use a fork or a shovel to push garden waste into the feeding hopper.
- Do not use your feet to feed garden waste further in the feeding hopper.
- Do not feed foreign materials. (Strings, stones, metal, plastic, textile, etc.)
- Do not constantly feed thick branches (with a maximum diameter of 140 mm) into the machine. As a guideline, no more than 10% of the material that is to be fed into the machine may have a diameter in excess of 100 mm.
- Never use a step when feeding garden waste into the machine.
- Never work in conditions where light intensity is less than 500 Lux.
- Avoid inhaling the exhaust fumes from the machine. Exhaust fumes contain toxic particles which could prove fatal. It is, therefore, prohibited to have the engine run for more than 30 sec. in an enclosed area.
- For deontological reasons, Eliet accepts no responsibility whatsoever **for any accidental injury** to pets or persons caused by its machines.

7.3.3 Responsibilities of the operator

- All persons using the machine are assumed to be fully conversant with the safety instructions. The operator is fully liable for the use of the machine in regard to himself and to third parties.
- It is assumed that the operator of this machine is mature enough and has enough common sense to make decisions by himself.
- Underage persons must not operate the machine. However, this does not apply to youths above the age of 16 years, who are learning to operate the machine under the supervision of an experienced operator.
- A disabled person may only operate the machine when under the supervision of an experienced operator.
- Children and animals must be kept well away from the machine.
- ELIET recommend that the machine should not be lent to others. However, if this is done, only lend it to persons who are conversant with the machine. Always ensure that the user is aware of the potential hazards, and ensure that he reads the manual before he uses the machine. (An

indicative list of potential hazards can be found in the Appendix.)

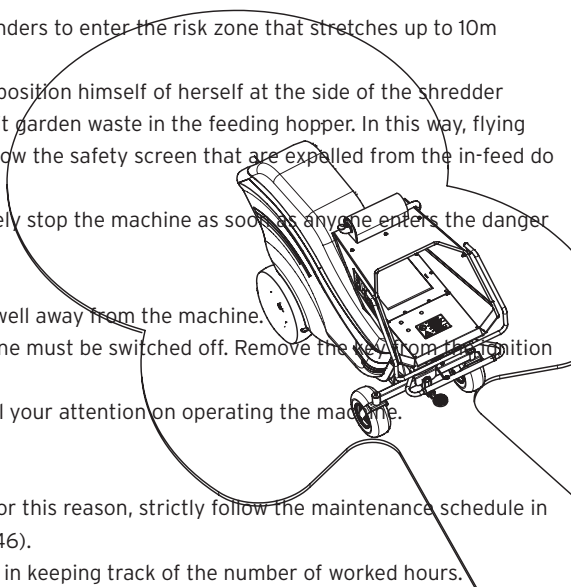
- This machine must only be operated by persons who are in good physical condition. If you become tired during the work, take a rest in due time. Persons consuming alcohol or drugs must not operate this machine.

7.3.4 Personal Protective Equipment (PPE)

- You must wear suitable clothing to operate this machine. That is, clothing covering the whole body, heavy protective gloves and closed non-slip footwear.
- Do not wear loose fitting clothing (a shawl, for instance, should be avoided by all means). Long hair should be contained using a cap or a headband, or worn in a ponytail.
- For the protection of the most sensitive senses, Eliet recommends ear defenders and safety goggles.
- You must pay more attention and be more careful when wearing ear defenders because noises that announce a danger (such as shouting, signal sounds) will only be heard to a limited degree. ELIET does not recommend using ear defenders that have inbuilt music equipment because of this.
- Shredding may result in dust production. If this dust irritates your lungs, we recommend that you wear a dust mask in accordance with the following standard: directive 89/686/EC.

7.3.5 Danger zone

- During the work, do not allow bystanders to enter the risk zone that stretches up to 10m around the machine.
- By preference, the operator should position himself or herself at the side of the shredder hopper if he or she wishes to deposit garden waste in the feeding hopper. In this way, flying chippings finding their way from below the safety screen that are expelled from the in-feed do not cause personal injury.
- Do not take any risks and immediately stop the machine as soon as anyone enters the danger area.
(read § 9.4; p. 26)
- Children and animals must be kept well away from the machine.
- When leaving the machine, the engine must be switched off. Remove the key from the ignition as a precaution.
- Once the engine is running, focus all your attention on operating the machine.



7.3.6 Periodic maintenance

- Periodic maintenance is essential. For this reason, strictly follow the maintenance schedule in this user manual (read § 11.2; p. 45-46).
- The maintenance counter will assist in keeping track of the number of worked hours.
(read Appendix E; p. 87)
- When replacing parts as a result of wear or failure, always request genuine ELIET service parts from your ELIET dealer. This is important in the interests of your own safety.

- Always ensure the engine has stopped and the battery cables are disconnected before performing repairs or maintenance. Always wait until the blades come to a complete standstill before carrying out any operation.

For your information:

Also, read the engine manual that comes supplied with the machine. This contains the information required for the correct use and maintenance of the engine.

7.3.7 Limits of the machine



- According to the manufacturer, this model will take branches up to 140 mm diameter. This diameter must not be exceeded in the interest of your own personal safety and to ensure a long life cycle of the machine.
- The chipper must only be loaded up to 70% of its maximum capacity

when temperatures are low and when there is frost.

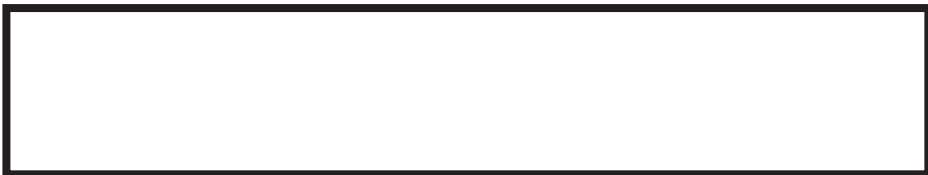
- The machine weighs 450 kg. Bear this in mind when transporting the machine.
- Weight on the front axle: 320 kg ; weight on the rear axle: 176 kg
- The maximum ground pressure of the machine amounts to 0,9 kg/cm² (front), 0,8 kg/cm² (rear): ensure at all times that the soil has a sufficient load carrying capacity.

7.3.8 Preserving Nature

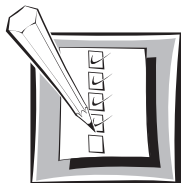
Use the machine in a manner that respects environmental regulations.

- Avoid unnecessary machine running while not at work. (Go for Eliet's EcoEye™ option which will automatically put the engine in the idle position during non-active moments.)
- Avoid spilling fuel while refuelling.
- When replacing/topping up the oil (engine or hydraulic fluids), the spent oil should be taken to specialised recycling centres.
- Service the engine regularly in order to achieve optimum combustion. The items below are very important with regard to the above:
 - Checking the air filter is not clogged.
 - Ensuring that the engine is cooled appropriately.
 - Checking whether the throttle valve does not close unintentionally.
 - Ensuring there is sufficient oil in the engine.
 - Having the carburettor checked regularly by an approved service centre.
 - Having the ignition checked regularly and, if required, replacing the spark plugs.

Should the above be ignored, the engine may start to function poorly. This may cause after-burning in the exhaust pipe which, in turn, has a negative effect on the catalyst. ELIET cannot, therefore, be held responsible should a catalyst burn and will, therefore, not accept any warranty claims with regard to this issue.



8. Dealer preparation



- As an ELIET Dealer you should familiarize your customers with the functioning of the machine and also point out the possible dangers while using it. You are expected to carefully go over the maintenance points of the machine together with the new owner. Repeat these instructions until the new owner has fully understood everything.



For your information:

An indicative list of potential hazards can be found in the Appendix.

The need for pointing out the following issue to the customer is something that cannot be over-emphasised:

ALL THE BOLTS RETAINING THE BLADES MUST BE EXAMINED FOR SECURITY OF FIXINGS AFTER THE FIRST 5 OPERATING HOURS. (TORQUE LOADING 76 NM)

- The machine could be packed with no oil in the engine crankcase and no fuel in the fuel tank. If needed, top up following the instructions of the engine manual supplied with the machine.
- Perform a test run on the machine and confirm that everything is functioning properly (such as the safety contact at the collection bag). (for example: engine speed, ABM system, hydraulic peak pressure, safety switches...)



For your information:

Refer to Appendix B (p. 83) in this manual when checking bolt fixings where the maximum torque loading of the bolts is given.

- Also check that the bolts securing the blades are fully tightened.
- Lastly, make sure that the warranty card is filled in completely and signed. This, in order to avoid any warranty disputes. Read the warranty conditions in the Appendix.
- In addition, also register the purchase online at www.eli.eu to ensure the warranty applies. This service will be online from September 2008. Before you need to register your purchase by sending back the filled in warranty form to Eliet Europe NV.

9. Operating instructions



9.1 Preliminary checks



Caution:

Before starting to shred, always run through the checklist below.

Checklist

- Check the oil level of the machine. (read § 11.4.1.1; p. 50)
- Ensure there is enough fuel in the tank. If necessary, fill up the tank with fuel. (Tank capacity: 20 L)



For your information:

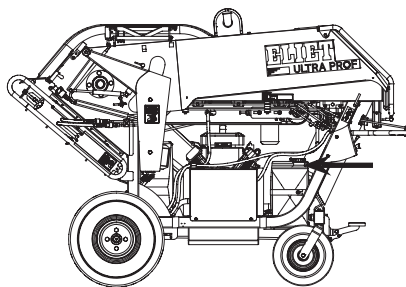
The engine runs on petrol. Always select the better type of petrol that will ensure a better combustion in the engine. (Lead-free 98 octane.)

- Verify that the air filter has not been contaminated too much (read § 11.4.3.; p. 52).
- Satisfy yourself that the shredding knives are firmly in place and in good condition. If they need to be sharpened, this must be done first (read § 11.5.2.; p. 57). If you detect cracks or fractures in a blade, this blade must be immediately replaced (read § 11.5.3.2; p. 62).
- Verify that all of the machine's safety items are operating correctly (read § 7.2; p. 17).

Once these items have been checked and approved, you can prepare the area of operation (read § 9.3; p. 26) and move the machine to the work site.

9.2 Filling up with petrol

- Since the fuel tank is transparent, you can easily estimate the fuel level. Lift the left safety guard to check the fuel level or to access the filling cap of the fuel tank.



For your information:

A full fuel tank equates to 20 litres of fuel which matches 8 hours of work under normal working conditions.

- Only use clean fresh petrol. The engine should be run on a minimum of 85 octane, preferably 98 or 99 octane. Any other fuels are prohibited. (Read the engine manual.)
- Never add oil to petrol.
- Because of the short shelf life of petrol, it is good practice to buy fuel in small quantities.
- Store petrol in a well-ventilated area away from open flames, sparks and heat sources.



Warning:

Under certain conditions, petrol is highly flammable and extremely explosive. Fire and explosion caused by petrol can result in serious burns or damage to property.

Thus, always take note of the following points: ipv.

- Do not add fuel while engine is running. Always allow a few minutes for the engine to cool off before topping up with fuel.
- Store fuel in an approved container. Keep this container out of the reach of children.
- Never top up fuel at a location where work is to be performed later. Always keep all persons at least 10 m away from the work site. This is done to prevent any fires from occurring.
- Clean the area around the fuel tank cap and then remove this cap. Never fill a tank to over 85% of the tank's capacity. Top up with fuel until the level is approximately 30 mm from the top of the tank. In short, do not fill the tank completely to the tank filler opening.
- Always use a funnel or spout to pour the fuel into the tank. Suitable funnels can be obtained from your ELIET dealer.
- Refit the cap onto the tank as soon as possible.

- Be careful not to spill petrol onto clothing. If petrol does come into contact with your clothing, change your clothing at once.



Caution:

It is unsafe and thus expressly forbidden to fill the fuel tank in the vicinity of smokers or naked flames.

- If fuel comes into contact with the eyes or is taken internally, obtain medical attention immediately.

9.3 Preparing the work site

- Clear the area first where the machine is to be used. In addition, the paths along which the plant trimmings are removed, must be kept clear, thus releasing you from the worries of tripping up over them. Also ensure your safety is not compromised.
- On slopes, never operate the machine (no forward, backward or lateral slope.).
- The material to be shredded is to be sorted beforehand. In this way, you can be sure that no foreign objects will enter the machine with the material to be shredded.
- Foreign objects are defined as: Any non-organic object or branchy material in excess of the stated capacity (such as metal, stone, plastic, PVC, cords, etc.). Some of these can cause serious damage to your machine or can be ejected, virtually as projectiles towards the user.
- Ensure to locate the machine such that flying chippings expelled from the discharge do not cause damage to persons or properties.
- Always position the machine so that the wind will blow the dust produced away from the machine.
- Ensure that the machine can be positioned in such a way that there is sufficient space to move away from the work site after depositing chippings.
- Ensure that the ground cover at the work site does not cover the suction opening of the cooling air.
- Never run the machine in an enclosed area. If this is done, there is a danger of being poisoned by the exhaust fumes from the engine.

9.4 Starting and stopping the fuel engine

A.Starting the fuel engine



For your information:

Read the engine manual that was delivered together with the machine and this manual.

- Before starting the engine, check that there is adequate oil and fuel in the engine. If necessary, read the following sections: § 9.2 (p. 25) & § 11.4.1.1 (p. 50)
- Remove third parties from the safety area around the machine. (See safety area on page)



Warning:

The engine must never be run in an enclosed area for a long period of time (> 30 sec.). Exhaust gases contain toxic substances and may lead to poisoning or suffocation.



Caution:

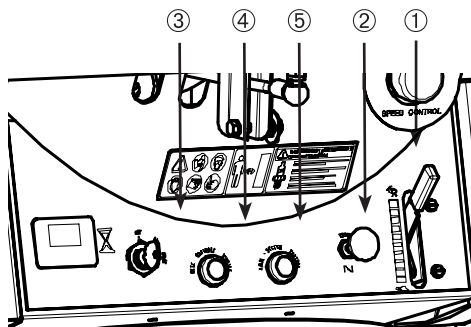
Never start up the machine if the cooling air suction intake is obstructed in any way (to prevent the engine from overheating).



Caution:

Before starting up the machine, make sure to wear the ear defenders supplied as standard.

- Verify that the shredding chamber is empty and whether the blade shaft can rotate freely. This is to avoid starter mechanism overloading.
- Ensure the shredder hopper is empty (no garden waste, no tools, etc.).
- Verify that the discharge belt conveyor is folded upwards (read Appendix A-P1; p. 78) and the safety switch pressed. If not, the machine cannot be started.
- Pull the black control handle around the feed opening fully towards you (STOP position) **(6)**.
- Move the throttle control lever **(1)** to the mid-position.
- Close the choke lever **(2)** by pulling the knob.
- Turn the ignition key **(3)** to the 1 position and make sure the red oil level pilot light **(4)** comes on. This lets you check the pilot light for proper operation. (If this is not the case, replace the light, Art n° BE 510 110 120 light.)
- Move the key to the 2 position; the start motor cranks the engine and the green pilot light **(5)** of the ABM system will come on for a few seconds.
- Release the key when the engine starts.
- Push the choke **(2)** fully home.
- Run the engine at full throttle **(1)**.



**Caution:**

If the engine refuses to start, do not allow it to run for too long a period of time (>5 sec). This could make the starting motor burn out. Investigate what has caused the problem.

**Caution:**

If the shredding chamber is still full of chippings, the engine will encounter a lot of resistance and it will be difficult or impossible to start the engine. Therefore, always empty the shredding chamber before starting the engine. (read Appendix A-P3; p. 80)

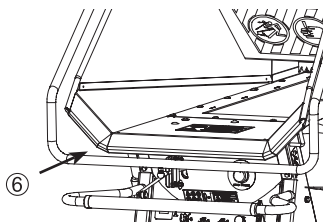
**Warning:**

The drive shaft for the blades is directly driven by the engine. These blades are permanently connected to and driven by the engine. This means that the machine becomes dangerous as soon as the motor starts running. The engine must therefore be switched off immediately if you encounter a situation where you no longer have control over the work.

B. Stopping the machine:**Caution:**

Always allow the shredding chamber to fully empty since this will avoid problems when you start the engine again.

- Move the black feed roller handlebar in the STOP position. **(6)**
- Move the throttle control lever **(1)** to low speed.
- The ABM pilot light will come on.
- Turn the ignition key **(3)** to the 0 position and remove from the ignition switch.
- Store the key in a safe place away from children and unauthorised persons.

**For your information:**

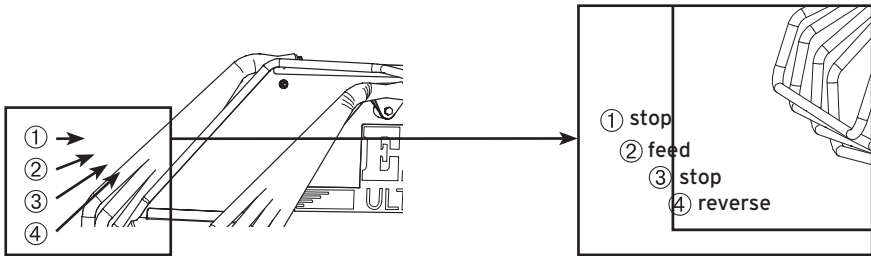
If the engine has been switched off, it is difficult to move the machine and, therefore, you should ensure that the machine is at the required location before switching off the engine.

9.5 Moving the machine

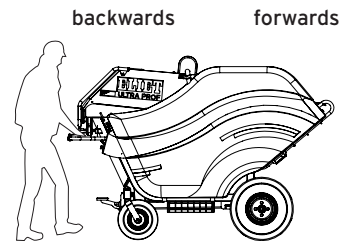


Warning :

the machine is a heavy piece of equipment. Know your own capability. Overuse of your back may cause prolonged pains, rheumatics and paralysis. Always seek assistance when lifting things that are too heavy for you.



- The two large traction wheels are each driven by one hydraulic wheel motor. The petrol engine must be running for the hydraulic unit to operate.
- Follow the procedure described in § 9.4 (p. 26).
- Move the throttle control lever so that the engine runs at medium speed.
- Before driving, make sure the feed and discharge systems are switched off. Move the lever to the 3rd position (STOP) in the direction of the feed. First always push the control handle control handle to its furthest position (position 4 = DISCHARGE) and then pull it back one position (3rd position = STOP). This will ensure that you are sure that the discharge belt conveyor is not running.
- The handlebar is provided with a rotational control lever. This lever allows you to operate wheel drive.
- If the control lever is turned forwards, the machine will run forwards. The more you turn, the higher the ground speed in the driving direction. If you turn the control lever in the opposite direction, backwards, the machine will reverse with a speed that is proportional to the turning of the control lever.
- You should always walk behind the machine when you move the machine a large distance (>5 m).
- Push the machine in the desired direction. The castors will follow the driving direction.



Caution:

The wheels have a powerful hydro motor drive. The machine can rear up or jump should the turning handle be operated very aggressively after it has stopped or if the driving direction is quickly changed (from reversing to driving forward). This may lead to the user losing control or becoming trapped under the heavy machine. Therefore take care and turn the control handle in steps.

TIP: It is a good idea to become acquainted with the characteristics of this self-propelled machine and do so in a quiet spacious location without bystanders or obstacles.

NOTE: You can also adjust the speed by accelerating or decelerating.

INFORMATION: The machine has a high centre of gravity a relatively narrow wheel base to offer access to gardens with a narrow entrance. This means that there may be a danger that the machine can tilt when driving over an uneven surface. You can optionally provide the machine with double traction wheels to prevent this from occurring. These wheels can be easily and quickly installed and removed. Art. n° MA 020 001 002



Warning:

Always turn the control handle in steps when descending a slope to ensure the mass inertia of the machine is kept under control. If the machine uncontrollably starts to gain speed, turn the control handle in the opposite direction so that the oil pressure can brake the wheel motors.

- If you wish to move the machine over a small distance without starting the engine, turn the control handle in the direction that you wish to go. Push or pull the machine simultaneously in that direction. Take the weight of the machine into account so that men cannot be injured when exerting this effort.

9.6 Operating the machine

- If the required checks have been performed (read § 9.1; p. 24).
- And if the chipper has been set up correctly in the working environment (read § 9.3; p. 26) and facilities are in place for collecting or discharging the chippings: The machine can be set to its working configuration.



Caution:

Be sure to always apply the parking brake whilst working.



NOTE: Safety rules must always be observed when working with the machine. (read § 9.4; p. 26). The operator must always wear suitable clothing: gloves and personal protection equipment (PPE) as prescribed in this manual (read § 7.3.4; p. 20).

- Start the engine. (read § 9.4; p. 26)



Warning: Once the engine is running, the shredding knives are rotating, therefore, irrevocably shredding anything that is introduced into the feeding hopper. Once the engine is running, be sure to always direct your attention fully to the machine and the work being performed.

- If the engine is still cold, allow the engine to run for a short while (5 minutes in idle) before starting to shred.
- Allow the engine to run at full speed when you start to feed green waste.
- Verify that the speed governor is not set to 0. (read § 9.6.2; p. 33)
- Next, switch on both the feed and discharge arrangements. (read § 9.6.1; p. 32)
- After feed arrangement (feed belt and feed roller) and discharge arrangement (output conveyor) startup (read § 9.6.1; p. 32), it is safe to start to introduce garden waste.
- Start by inserting a quantity of small fine garden waste while the engine has only been running for a short period of time. After approximately 5 minutes of having the engine running, you can gradually also insert thicker branches.
- Ensure that the garden waste does not contain any foreign objects.
- Always insert branches with the thickest part first.
- Thicker branches or trunks must, by preference, be shredded with all their twigs, side branches and foliage attached.
- Long branches (in excess of 1,500 mm) should be pushed in until the feed roller grabs them.
- Small bulky garden waste should be fed to the feed belt, which will take them to the feed roller.
- Use a spade or fork to make the feeding of small garden waste easier.
Note: Never, however, allow these tools to enter the feeding hopper !
- Sometimes the garden waste will not uniformly enter the hopper but it will be introduced in fits and starts. This indicates that the automatic ABM system is operational (read § 9.6.3; p. 34).



Caution:

The maximum lift of the feed roller is 140 mm. Never feed wood with a diameter that is thicker than 140 mm.

- Do not constantly feed thick branches (with a maximum diameter of 140 mm) into the machine. As a guideline, no more than 10% of the material that is to be fed into the machine may have a diameter in excess of 100 mm.
- Read the series of tips in § 9.6.4 (p.34) before you use the chipper.



Warning:

Never lean forwards in the hopper when the feed arrangement is in operation.

**Warning:**

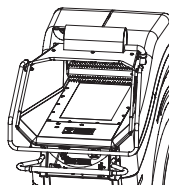
Although the machine has been designed to stop material kickback there is a risk of chippings being projected through the feeding hopper. The danger is the highest when stripped branches with a diameter > 70 mm are inserted. When the feed roller exerts a gripping tension and lifts itself on the branch, an opening is created under the feed roller along which chippings can fly out of the shredding chamber. Be careful and ensure that you are standing next to the hopper at this time.

**Caution:**

If you notice a strange noise during the work, immediately stop shredding. Stop the engine and investigate the cause. Before proceeding, perform the necessary repairs.

NOTE: In an emergency situation or in a situation of uncertainty where you lose control over the shredding process, you must push the control handle away from yourself to the farthest position.

9.6.1 Before starting work



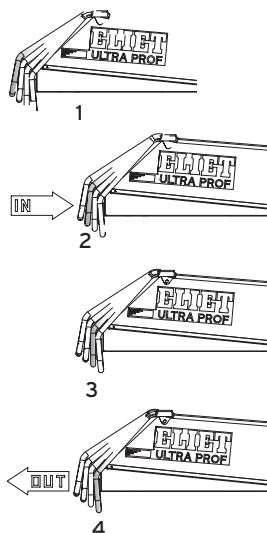
The feeding hopper contains two synchronously operating feed arrangements:

- a) Feed belt: This belt will assist in feeding small garden waste. The feed belt drives the garden waste in the direction of the feed roller so that the operator does not have to put his or her hands in the machine.
- b) The feed roller: A driven roller that pushes the garden waste into the shredding chamber.

- The black lever around the feed opening should be used to operate the feed arrangement. The lever has four switching positions:

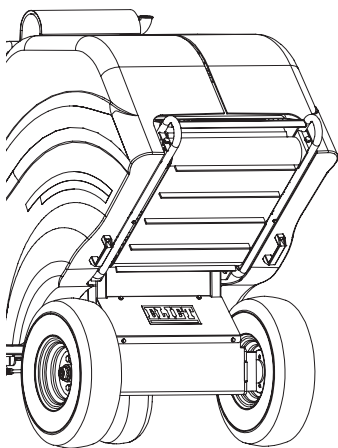
- | | |
|--|--------------|
| 1: First position in the feed direction: | stop |
| 2: Second position in the feed direction: | feed |
| 3: Third position in the feed direction: | stop |
| 4: Furthest position in the feed direction: | reverse feed |

NOTE: A hydraulic valve controls the respective positions of the control lever. It is important that you always hear or feel a click when the control handle locks into its position. If you do not exactly switch the lever, the functioning of the feed arrangement will, on the one hand, not be optimal and, on the other hand, the hydraulic oil may heat up too much. This may lead to faults or failures in the hydraulic system.



OPERATION SUMMARY:

- Set the control lever to switching position 2 to start shredding.
- Stopping the feeding of the chipper is a simple operation: Either move the control lever one position away or towards yourself.
- If you want to reverse feed the material that is moving in the feeding hopper in the direction of the shredding chamber, press the control handle fully away towards the furthest switching position.

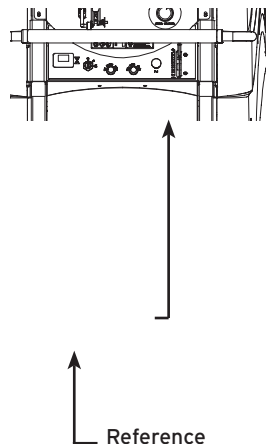


The discharge arrangement can be found on the rear of the machine. This is a discharge belt conveyor that collects the chippings discharged by the shredding chamber and takes them away from the machine.

- The discharge belt conveyor is automatically switched on when the feed arrangement is switched on. The discharge belt conveyor will continuously run when you switch between positions 1 (stop), 2 (feed) and 3 (stop) for the feed operation during shredding to ensure that the chippings do not mount up at the back of the machine.
- The discharge belt conveyor can be switched off by pressing the black control lever in the farthest position (position 4 = reverse feed).
- Move the black control handle back to position 2 (feed) to again activate the discharge belt conveyor after switching off.

9.6.2 Feed speed regulation

- In order to improve shredding output, select the correct feed speed depending on the nature and/or thickness of the garden waste to be processed.
- To this effect, a manual speed governor is delivered as standard equipment on this machine. It is located on the right underneath the feed opening immediately above the instrument panel.
- The material feed speed can be set on a scale of 0 to 10 by using the rotary switch, where 0 is: machine stopped and 10: maximum material feed speed. The reference point is as indicated on the figure.
- The speed can be changed at all times.



Lower material feed speed in the following cases:

- When shredding wood with tough fibres that are less suitable for the shredding properties of the ELIET shredding system.
- When large volumes of leafy material is fed consecutively.
- When branches will be fed that are in excess of 100 mm for some time.

**Warning :**

Remember: When shredding at temperatures around freezing, maximum branch size of branchy material is limited to 70 mm.

9.6.3 ABM system

The machine comes as standard with an anti-block motor system (ABM).

- This ABM system monitors the performance of the engine and will automatically intervene when the speed falls below a critical rpm level by regulating garden waste supply.
- Result:
 - The machine is overload protected.
 - The machine will autonomously check its operation and the operator needs only to concentrate on the in-feed of material.
 - Less consumption and improved efficient operation.
- The discharge belt conveyor will always discharge material with a constant speed. The anti-block motor system (ABM) will not affect the operation of the output conveyor.

9.6.4 Tips for correct use

The ABM-system entails great comfort of use for the operator but, in certain situations, the ABM system may need assistance in that the operator must be involved when the machine flashes:

- The ABM system will continuously switch on and off the feed when processing long and thick branches that have the maximum diameter ($100 < > 140$ mm) over the entire length. Every time the engine speed picks up again, the ABM will again start the feeding and the machine will again process the full load. Since we are here dealing with the limit of what the machine can do, a small additional effort is sufficient for the machine to encounter problems. The operator should be in the vicinity as a precautionary measure so that he or she can manually intervene if the machine should threaten to jam:
 - You can then modify the material feed speed;
 - Alternatively, you can switch off the feed for a short period by pulling the control handle one position backwards (position 1) or by pressing the control handle one position forward (position 3).
 - The wood can, if required, be returned by pressing the control handle forwards (4) and the redirect the branch and have it fed in again.

The ABM system acts only on the feed roller and the feed belt. However, neither the ABM system nor the operator can manipulate garden waste that has gone through the feed roller. This is why the operator must already avoid problems when introducing material in the feeding hopper with regard to certain types of garden waste:

- With irregular branches (nodes, forked branches), ensure to feed them to the feed roller in an optimal position. Stop, if required, the roller and reposition the branch halfway to ensure that the machine cannot jam.

- Thick truncated trunks without foliage represent a certain risk when shredding. The truncated end of the trunk, in particular, may move to take up a diagonal position over the feed-in width when it moves under the feed roller. This forms a sudden load for the machine that represents a branch that is positioned diagonally and with a diameter that equals the length of the trunk end. It, therefore, stands to reason that the machine will jam. ELIET recommends, therefore, to place short truncated trunks against the side wall of the feeding hopper. The side will ensure that the trunk is guided straight so that there is less of a risk that this will be positioned diagonally across the blades.
- Ensure you pay additional attention when simultaneously inserting multiple branches with different diameters. The branch with the thickest diameter will lift the feed roller while the smaller branches could be pulled in by the blade system in an uncontrolled fashion. This can mean that the machine encounters problems. By preference, insert branches that have a similar diameter.
- Always estimate the processing capacity of the inserted quantity. Take into account that not always the newly inserted garden waste will determine the requested capacity but also that the quantity of chippings that are still rotating in the shredding chamber and are being made even smaller take up part of the shredding capacity.
- Inserting a large quantity of leafy waste all at once will demand a certain interval of time from the machine to process the quantity. Therefore, ensure that the new input does not demand a shredding capacity that is too high. When you hear that the engine again reaches full speed, you can return to full power.
- Regularly check for accumulations of sticking chippings in the shredding chamber when shredding wet garden waste for a protracted period of time. This can continue to build up and block a section of the sieve screen. This will reduce the surface area along which the chippings can exit the shredding chamber. This will lead to the machine requiring more time to process the volume of chippings which means that machine performance will drop. If you determine that despite the feed of new garden waste, few chippings exit the machine and the engine slows down considerably, stop the machine to unblock it. (read § 9.7.4; p. 41 or § 9.7.5; p. 41)
- Ensure that there is sufficient variety between woody and leafy material ensure that sieve screen obstruction is avoided when shredding wet and leafy waste. Wood chips ensure that leaf chipping pulp that sticks is ripped off and pressed through the screen.
- If there is no woody material to vary with, install a sieve screen with larger mesh size (sieve opening size). They will reduce the probability that an obstruction will occur. Such a screen can be ordered at a later date from an authorized ELIET dealer. (Art. n° MA 020 001 003)
- When shredding climbing plants or weed suppressants, there is a risk that long trailing bits will wrap around the feed roller or the blade shaft. Firmly roll up the trailing bits until you obtain a long coiled bundle to somewhat avoid this situation. This should, next, be inserted as a branch. If you slightly adjust the material feed speed at the same time, you can still process such garden waste fairly quickly.
- If small garden waste is being inserted, ensure that all small branches are inserted by preference in the same direction. This will ensure that the feed roller has a grip on the waste fairly quickly and that it can pull it as one mass into the shredding chamber. Neither the feed belt nor the feed roller will quickly transport the material if, on the contrary, twigs are thrown into the hopper unclassified. Operator intervention will be required in such a situation which means that the processing time will increase and performance will fall.

9.7 Troubleshooting

9.7.1 Engine failure

If the engine suddenly fails during operation, this may be due to a number of causes:

- a) Lack of petrol
- b) Lack of oil in the engine
- c) One of the safety switches has been activated
- d) Overloading
- e) Technical fault



Caution:

Before starting the investigation to determine the cause for the failure, always set the start key to the OFF position.

The following can be undertaken to restart the engine in the case of:

A. Lack of petrol

The fuel tank is located at the front of the machine. An area of the fuel tank can be seen from the operator position. Since the tank is transparent you can easily check the fuel level in the tank. If you notice that fuel cannot be seen anymore, this will be the cause of the failure. Top it up with petrol (read §9.2; p. 25). Energize the starting motor. Close the throttle valve (choke). This will supply petrol to the carburettor. The engine will start once fuel flows to the carburettor.

B. Lack of oil in the engine

The engine crankcase is filled with engine oil for piston lubrication and cooling. There will be a danger of earlier wear of the engine when there is a lack of oil. A control switch has been provided to protect the engine. This switch will switch off the engine when there is a lack of oil. The red light on the dashboard will light up (or the message will be displayed on the LCD display*). (*On machines equipped with the optional EcoEye™ system.)

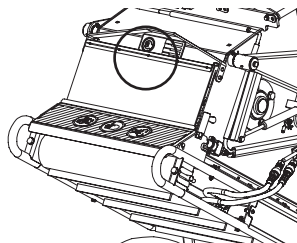
Check the oil level and top it up if required. (read § 11.4.1; p. 50)

Check the switch for correct operation. To do so, disconnect the switch wiring and repeat the normal start procedure. If the engine does crank, this points to a fault of the oil alarm and it must, therefore, be replaced. Please contact your authorized ELIET dealer or a service outlet of the engine make.

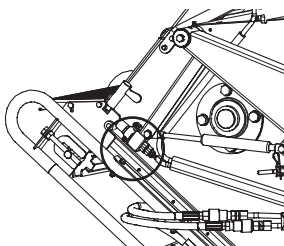
C. Safety switch activated

Two integrated safety switches ensure that the operator is not given undesired access to moving machine parts or dangerous areas while the machine is in operation:

- One can be found on the larger safety guard. **(1)**
- One can be found on the discharge belt conveyor. **(2)**



(1)



(2)

These safety switches will interrupt the ignition of the engine when activated. A mechanical or electrical fault of this switch may stop the machine without warning while shredding. Perform checks on the following control points in chronological order to spot the possible failure:

- First check whether the shielding panels and discharge belt conveyor are fastened correctly so that the switch is fully pressed.
- Verify that the switch is still correctly attached. A switch can become loose or shift due to vibration.
- Check the wiring of the switch for an open or damage.
- Measure the correct operation of the switch using a resistance meter at every output (NO circuit/NC circuit).
- Repair or replace as appropriate and restart the machine.

D. Overloading

Although the machine is equipped with an Anti Engine Blockage system (ABM), the blade system may become blocked due to a piece of wood due to an unfortunate set of conditions. This will also cause the engine to stop since it is not disengaged.

- Open the shredding chamber (read Appendix A-P3; p. 80).



Caution:

The blades are razor-sharp and, therefore, always wear gloves and avoid touching the blades.

- Remove the chippings from the shredding chamber.
- Verify that a piece of wood is not stuck in the area between the feed roller and blade shaft.
- If the blade shaft is jammed, release it (read § 9.7.5; p. 41).

The sieve screen may become blocked and, therefore, the shredding chamber may become full with chippings. Ultimately the resistance that this produces will be too great and the engine will fail.

- Open the shredding chamber (read Appendix A-P3; p. 80).
- Remove the chippings from the shredding chamber and clean the sieve screen. The discharge belt conveyor may stop, which means that the chippings that exit the shredding chamber are no longer discharged. The accumulation of these chippings will fully seal the discharge and the machine will eventually fail. The output conveyor that has stopped will also disrupt the flow of oil in the hydraulic circuit which, in turn, will lead to a build up of pressure that requires additional power from the petrol engine. This in combination with additional resistance of the overfull shredding chamber, will speed up engine failure.
- Check the discharge belt conveyor for correct operation (read § 9.7.5; p. 41).
- Open the shredding chamber (read Appendix-P3; p. 80).
- Remove the chippings from the shredding chamber.

E. Technical faults

If the above checks could not determine the cause, the problem will probably be of a technical nature. This may be related to fault in the engine or a fault in the electric system of the machine. Please contact your authorized ELIET dealer or a service outlet of the engine make.

9.7.2 Engine losing power

If you notice that the machine attains a lower power during a long period of time and performance has significantly been reduced, trace the cause for this. The following items may be related to this issue:

- a) Blade system
- b) Dirty air filter (read § 11.4.4; p. 53)
- c) Spark plugs Glow plugs (read § 11.4.7; p. 55)
- d) Hydraulics problem
- e) Overheated
- f) Fuel supply problems
- g) Poor combustion

Analyse the above elements in the order given to determine the cause for the reduced performance:

A. Blade system

Since the blades are in charge of the shredding, first check the state of the blades (read § 11.5.1; p. 56).

B. Dirty air filter

If the air filter is clogged with dust, the engine may be receiving insufficient air and the under-pressure in the carburettor will increase, which means that more petrol is sucked in. This disrupts the optimal petrol-air ratio with regard to combustion and entails a large performance loss and additional consumption (read § 11.4.4; p. 53).



Warning:

A poor combustion in the engine will lead to after-burning in the exhaust. This increased exhaust temperature can seriously damage the catalyst. Such damage and consequential damage to the engine are not covered by the Guarantee.

C. Spark plugs

The engine is of the 4-stroke type and has two cylinders in this chipper model. Every cylinder has its own spark plug that will ensure that there is ignition every time the crankshaft rotates. This feature ensures that the engine reacts strongly and can maintain its speed while loaded. If one of the spark plugs is faulty, all of the load will be borne by one piston and there will only be one ignition for every two revolutions. This can be compared with halving the power.

(read § 11.4.7; p. 55)

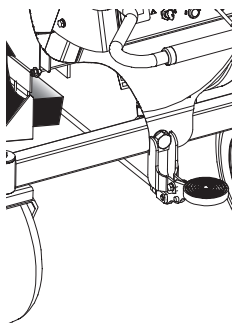
D. Hydraulics problem

The hydraulic circuit is a closed system where the hydraulic pump pumps oil around and to drive hydromotors at a specific pressure. The hydraulic valves determine the direction in which the oil will be sent and monitor the maximum pressure level. Since the feed belt, feed roller, and output conveyor are driven hydraulically, these hydraulics determine to a large extent the performance of the shredding. We recommend consulting an authorized ELIET dealer should there be any problems with the hydraulics. There are a number of simple checks that you can perform yourself to solve performance loss.

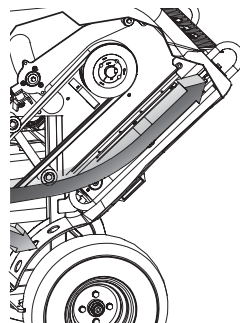
- Verify that the hydraulic speed governor has been adjusted to the required speed.
(read § 9.6.2; p. 33)
- Always check whether the valves are in their switching position. Due to wear or deformation of the control lever or rods, a valve may not be able to be switched to the correct position. This leads to leaks or pressure build-up in the valve and, therefore, the linked components in the hydraulic circuit receive insufficient flow rate or working pressure.
- The oil may have been heated too much due to a short blockage of the feed or discharge system. Allow the machine to cool down for a short period of time with safety guards folded upwards and then continue your work.

E. Overheating

Good cooling is essential for both the petrol and the hydraulic system for optimum performance. The petrol engine, in particular, produces a lot of heat and, therefore, it is important that there is a good flow of the cooling air over the engine and in the machine. A loss of power may lead to a lack of cooling. Check the cooling air flow (read § 11.3.3; p. 50).



cold air intake



hot air outflow

F. Fuel supply problems

The petrol from the fuel tank is pumped to the carburettor by a small vacuum pump. There is a fuel filter in this petrol line that will stop dirt from reaching the carburettor. This filter can become obstructed in due course and must then be replaced.

- Check the fuel filter (read the procedure in the engine manual).
- Dirt can accumulate in a narrowing in the petrol line. Disconnect the line from the fuel filter and blow it out using compressed air.
- Verify that there is not an accumulation of dirt in the fuel tank. Remove the dirt by discharging the petrol by using the drainage plug.



G. Poor combustion

Since the engine is the power source, it has the greatest influence on performance. The optimal functioning of the engine can only be guaranteed when combustion is good. Check whether the throttle valve closes automatically while operational due to vibrations or a lack of maintenance. This will bring too much petrol into the engine and, therefore, combustion will be incomplete.

This can be checked during your regular visit to an authorized ELIET dealer or an engine service centre. Request that the following be performed when it is again put in for a service:

- An overhaul of the carburettor
- A check of the ignition
- Post-measuring and adjustment the valve clearance



Warning:

A poor combustion in the engine will lead to after-burning in the exhaust. This increased exhaust temperature can seriously damage the catalyst. Such damage and consequential damage to the engine are not covered by the Guarantee.

9.7.3 Problem with the ABM system

The ABM system will ensure that the feeding is interrupted if the engine falls below a critical speed (2,750 rpm). The feeding will be restarted when the engine is again reaches a set speed (2,800 rpm). This stopping and starting of the feed system (roller and belt) takes place through a solenoid valve that will or will not close the supply of the hydraulic oil. Three phenomena can occur:

1. The feed roller and feed belt continuously run independently from the speed of the engine.
2. The ABM system is activated due to a deviating speed.
3. The roller and belt no longer run at the feed position.

ELIET recommends with regard to all three situations that you contact an authorized ELIET dealer.

9.7.4 Blockage of the discharge system

If you notice that the engine suddenly runs slower for no apparent reason, quickly check whether the discharge belt conveyor is still running. In an exceptional case a piece of wood may have become stuck and may, therefore, block the belt. Follow the following steps to quickly unblock the discharge system:

- Immediately stop the feed by pressing the control handle completely forwards.
- Switch off the engine and remove the ignition key from the ignition switch.
- Open both shielding panels (read Appendix A-P1; p.78).
- Remove the discharge belt conveyor (read Appendix A-P2; p.79).
- Investigate where the belt is jamming. The cause may be chippings, accumulated wood dust, a broken branch, etc. If possible, remove the obstruction. If the cause cannot be located, contact an authorized ELIET dealer.
- If the belt does not jam and you can manually smoothly turn it, it will probably involve a drive transmission problem.
 - Remove the shielding panel (read Appendix A-P5; p.82).
 - Check the chain, chain tension and the splined connection on the sprockets.
 - Carry out the required repairs or visit your authorised ELIET dealer for replacement parts. (See § 11.5.6, Tensioning the chain.)
- Refit the discharge belt conveyor in its original position. (read Appendix A-P1; p.78)

9.7.5 Rotor stalls

The rotor is blocked during shredding due to an unfortunate concurrence of events. The engine cannot be started if the rotor is jammed on a piece of wood. Follow the steps below to free the rotor:



Caution:

Suitable clothing and strong gloves are required if you are to perform work in the vicinity of the blade system.

- First turn the start key to stop and remove it from the ignition.
- Pull out all branches that can be found in the feeding hopper.
- Now open the shredding chamber so that you can remove all chippings and pieces of wood. (read Appendix A-P3; p.80)
- Lock the feed roller in its top position (read Appendix A-P4; p.82) .
- Once the roller has lifted, the blockage due to the piece of wood will hopefully have been removed. This will ensure that you only have to remove all garden waste from the branch that is jammed through the feeding hopper.
- If you cannot remove the wood because the blades are stuck in it, the rotor has to be dislodged.



Warning:

Never try to turn the blade shaft by grabbing the blades. The blades are razor-sharp and may even cause serious cuts when you wear gloves.

- Use the pulley as a turning wheel to dislodge the rotor. By repeatedly turning the pulley to the left and right, the blades will be dislodged from the wood.



Warning:

The blades are razor-sharp. Take extra care and avoid touching the blades even if you wear very good gloves.

9.7.6 Moving the machine with a faulty engine

Since the drive hydraulic pump is driven by the petrol engine, all hydraulic functions will be non-operational should the engine be faulty. The wheel drive is also hydraulic: Follow the steps below to move the 450 kg shredder.

- This operation must be performed by at least 2 persons.
- Set the black control lever for the feed mechanism to the "STOP" position (position 1 or 3).
- Turn the control handle for the wheel drive to the required direction and simultaneously push the machine forward.
- The machine can only be moved with difficulty in this way. You will, after all, also feel the resistance of the hydraulic drive components as well as the weight of the machine.



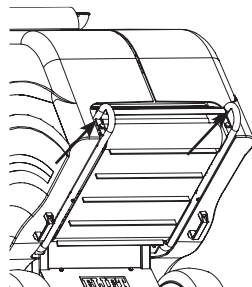
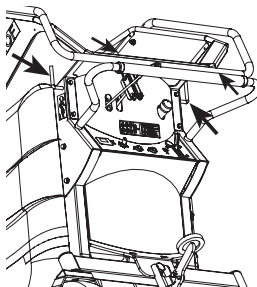
Warning:

Never apply this method on a slope. The machine may drive down the slope with an uncontrollable speed. There is no brake function when there is no hydraulic pressure. The parking brake is not dimensioned to stop at a short distance with this weight while on the move.

10 Transporting the machine



- Make sure to clear the shredding chamber before moving the machine. Make sure the feed opening is free of branchy material.
- Use slip resistant ramps to load the machine into a van or a trailer. Every ramp should be at least 400 mm wide. The load-bearing capacity must be able to cope with a weight of 750 kg.
- Ensure that there is a sufficiently large braking distance area behind the ramps (10 m).
- Ensure that the ramps are securely attached to the vehicle or trailer.
- Ensure the parking brake of the vehicle is on.
- Under no circumstances must the angle of the up or down ramp be greater than 15 %.
- The maximum allowable lateral slope angle amounts to 5 %.
- Be careful and composed when loading and unloading the shredder so that the machine does not tip (450 kg) over and give rise to an accident.
- When walking down a slope, move down backwards facing the machine. Take care when descending because the machine may suddenly gather speed because of its own mass. Ensure that there is a sufficiently large braking distance area behind the ramps (10 m).
- Make sure to properly secure the machine to the vehicle during transportation. Only use fixed chassis parts to secure rope.
- There are 4 attachment points on the machine to which rope and attachment systems can be secured.



Caution:

Do not forget that the machine has a high centre of gravity. Therefore use ropes to secure both sides of the machine to the vehicle. This ensures that the machine is not toppled over when the vehicle goes around a bend.

- Do not overload the vehicle or means of transport. The machine weighs 450 kg.

11. Maintenance



11.1 General provisions



For your information:

The dealer's personnel are always at your service. The ELIET dealer can always rely on comprehensive support from ELIET, so that we can work together to find a solution for any problem that you may have. For a repair or for the maintenance of the engine, you can always contact your ELIET dealer or a maintenance service that is recognized by the engine manufacturer. If you need to contact these services, please provide us with the Model Number and Serial Number of both the machine and the engine, and also describe the problem in detail.



Caution:

Only use genuine ELIET replacement parts. These service parts are manufactured to the same strict quality control requirements and degree of craftsmanship as the original equipment.

For your safety, use only genuine ELIET parts on ELIET machines.

Perform maintenance in a room intended for this purpose. This room must be

- Spacious
- Easily accessible
- Quiet
- Well lit
- Well ventilated
- Dust-free
- Clean and tidy

These characteristics are important to enable maintenance to be performed in an optimal manner.



Caution:

Maintenance performed in an incorrect manner can subsequently compromise the safety of the operator.

- Always ensure that the engine is switched off before performing maintenance work. Always remove the key from the ignition.
- Prior to doing service operations, first make sure to disconnect the battery cables. (Disconnecting the positive cable)
- When performing maintenance, always wear gloves, and also safety glasses for some operations. These are included with the machine.

TIP:

The maintenance work described can essentially be performed by any person who possesses the requisite technical knowledge. However, ELIET recommends that the machine should be brought to an ELIET dealer for a major overhaul each year.

Your ELIET dealer is always at your service for maintenance and advice. Your dealer will stock genuine ELIET service parts and lubricants. Your dealer's staff can always obtain advice and service from ELIET's HQ, so that they can provide you with an impeccable after-sales service.



Warning:

If the safety guards need to be removed to perform maintenance work, put these back correctly once the maintenance has been performed. Guards are provided to ensure your safety.

11.2 Maintenance schedules

11.2.1 Special maintenance

A. Special maintenance to the knives

After inserting the blades into the rotor, the blades will bed-in after a brief period. This can cause the tension on the bolts to decrease, with the risk that the blades may become dislodged between the blade plates. This can cause irrevocable fatigue failure of the blade shaft. This must be prevented by scheduling extra maintenance after the brief bedding-in period.

WHEN: Within the first five operating hours after starting up the new machine
 Within the first 5 hours after rotating the blades
 Within the first 5 hours after changing the blades

WHAT: Check all blade bolts for correct torque loading and retighten if considered necessary. (torque loading: 76 Nm)

**Warning:**

Failure to perform this special maintenance will compromise the safety of the operators and bystanders and can cause serious damage to the machine.

B. Special maintenance of the drive belt

The belt that transfers the power from the engine to the blade shaft is long. During the bedding-in period, the belt will stretch naturally to a certain extent. This stretching will reduce the belt tension. Using the machine when the belt tension is too low will cause the belt to slip, twist or wear down. These three possibilities have a detrimental effect on a new belt.

WHEN: Within the first 10 operating hours after starting up the new machine
Within the first 10 hours after changing a belt

WHAT: Check the belt tension (read § 11.5.4; p. 63).
Tension the belt (read § 11.5.4; p. 63).

11.2.2 Regular maintenance schedule**A. Daily maintenance****Caution:**

Before performing any maintenance, stop the engine and remove the key from the ignition switch. Wear suitable clothing.

- Check for signs of leakage
- Clean the machine (read § 11.3; p. 48)
- Clean the cooling system (read § 11.3; p. 48)
- Clean the air filter. (read § 11.4.4; p. 53)
- Check the oil level in the engine crankcase (read § 11.4.1; p. 50)
- Inspect the blades, and if necessary, sharpen them (read § 11.5.1; p.56)
- Check the machine for signs of abnormal wear or fractures
- Check the bolts for correct tightness. (Blades, wheels, bearings, engine, etc.)

B. Maintenance after 50 hours**Caution:**

Before performing any maintenance, stop the engine and remove the key from the ignition switch. Wear suitable clothing.

- Daily maintenance (read § 11.2.2; p.46)
- Change the engine oil (read § 11.4.2; p.52)
- Check the belt for tension and, if necessary, adjust the tension (read § 11.5.4; p.63)
- Check the tension of the feed and discharge belt conveyors and adjust the tension if required (read § 11.5.5 & § 11.5.6; p.65)
- Check the chain tension and, if necessary, adjust the tension. (read § 11.5.7; p.66)
- Check the spark plugs (read § 11.4.7; p.55)
- Check the belt tension (read § 11.5.5; p.65)
- General lubrication (read § 11.6; p.72)

C. Maintenance after 100 hours (or six-monthly)



Caution:

Before performing any maintenance, stop the engine and remove the key from the ignition switch. Wear suitable clothing.

- Perform maintenance after 50 hours (read § 11.2.2; p.46)
- Reverse the RESIST™ blades (read § 11.5.3.1; p.59)
- Change the air filter (read § 11.4.5; p.54)
- Replace the oil filter (read § 11.4.3; p.52)

D. Maintenance after 200 hours (or annually)



Caution:

Before performing any maintenance, stop the engine and remove the key from the ignition switch. Wear suitable clothing.

- Perform maintenance after 100 hours (read § 11.2.2; p.46)
- Replace the RESIST™ blades (read § 11.5.3.2; p.62)
- Replace the fuel filter (read § 11.4.6; p. 54)
- Change the spark plugs (read the engine manual)
- Adjust the parking brake (read § 11.5.12; p.71)

E. Maintenance after every 400 hours (or every two years)



Caution:

Before performing any maintenance, stop the engine and remove the key from the ignition switch. Wear suitable clothing.

- Perform maintenance after 200 hours (read § 11.2.2; p.46).
- Change the hydraulic oil and oil filter (read § 11.5.8; p.68).
- Replace the gas spring (read § 11.5.9; p.69).
- Replace the elastic coupling of the hydropump (read § 11.5.10; p.69).

11.3 Cleaning the machine

11.3.1 The importance of cleaning

ELIET recommends cleaning the machine every time that it has been used.

Regard every cleaning instance as an inspection where the good condition of the components and the machine is checked. You can, thus, intervene on time to prevent faults and failures. This will ensure that the service life of your machine is improved.

Not cleaning the machine will lead to:

- Premature wear of the bearings, gaskets and drive belts
- Increased risk of fire
- Decreased cooling efficiency of the engine
- Reduced performance
- A detrimental effect on the paint coating and the safety stickers
- Not noticing breaks or wear at an early stage

Note : The warranty will not apply should daily cleaning be ignored.



Warning:

If the machine does not operate optimally, this can compromise the safety of the user.



Warning:

Wood residue, chippings and fine dust can accumulate under the guards and cause a fire due to being heated. Avoid similar deposits in the vicinity of electrical components, batteries, the engine and the exhaust. Clean the machine thoroughly on a daily basis.



Caution:

Wear suitable clothing when cleaning. Gloves are required.

11.3.2 What is cleaning about

Cleaning the machine does not just entail cleaning the external components. Also open all guards so that the hidden areas can also be cleaned. A number of items deserve special attention:

- Air filter (read § 11.4.4; p.53)
- Electrical wiring and switching components.
- Fine wood dust deposit in the cooling air flow around the engine
- Cooling air inlets and outlets. (read § 11.3.3; p.50)
- Chippings from the grooves of the drive belt
- Battery
- Areas around the bearings of the rotor
- Drive and bearing rollers of the discharge belt conveyor
- Bearings + scrapers and dust evacuation of the feed belt
- Hydraulic valves and quick fit connectors
- Feed roller guides
- Use a dry cloth, a soft brush, etc. for cleaning. To remove spent grease and lubricants, use penetrating oil containing molybdenum disulphide. This spray lubricates and also dissolves rust.
- Once spent lubricant has been wiped away, it is important that new lubricant is applied to continue to guarantee the correct operation of the machine. (A list with recommended lubricants can be found in Appendix B; p.83)
- Compressed air is a handy tool to easily blow out a number of issues.



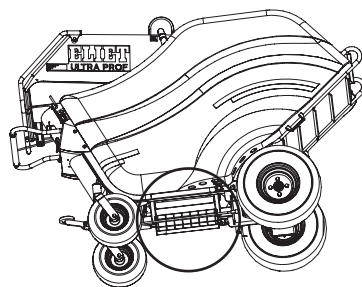
Caution:

Seals can be damaged when compressed air is used !

- Pressure-washing of the machine is permitted. However, never point the water jet in the direction of bearings, electrical contacts or filler caps. Water is known to be the main cause of corrosion and must, therefore, be avoided at all times. Allow the engine to cool down prior to hosing it down using a jet of cold water.
- Empty the feeding hopper and the discharge completely before storing the machine. The acid juices of certain garden waste chippings may affect the paintwork but they may also oxidise untreated blank metal which may promote rust.

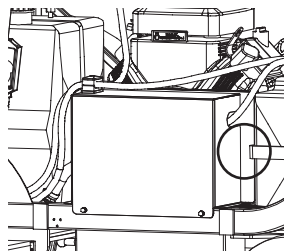
11.3.3 Cleaning the cooling system

For safety and noise considerations, the mechanical centre of the machine has been fully enclosed by large safety guards. Many mechanical components produce heat due to their operation (engines, hydraulics, belts, blade shafts, etc.). This heat must be able to be removed from the space inside the shielding panels. Cooling is required and for this reason it is important that there is a good flow of fresh cooling air brought in throughout the machine. See the cooling air flow in the following figure. Verify that the air filter intake is free from obstruction. See the cooling air flow in the following figure.



(1)

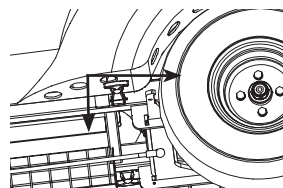
- Verify that the cooling air suction intake is free from obstruction. **(1)**
- Verify that the black air box fits in properly with the engine so that the cooling air is not mixed with hot air. **(2)**
- Always clean debris from engine cooling fins. **(3)**
- Verify that the hot air outlets are free from obstruction. **(4)**
- Verify that there is no accumulation of chipping residue that can prevent the cooling of the structure and the hydraulic components.



(2)



(3)



(4)

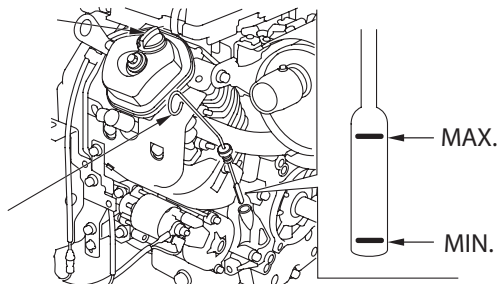
11.4 Engine maintenance

11.4.1 Checking the oil level in the engine crankcase + refilling the engine oil

11.4.1.1 Checking the oil level

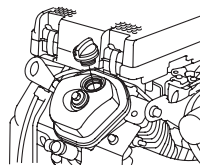
If a serious shortage of oil occurs in the engine, the electronics on the machine will switch to the safety mode and the engine will automatically switch off. It follows, that the machine has been working with a faulty lubrication for a long period of time. Regularly checking the oil level is essential to ensure this situation is avoided.

- Park the machine on a level surface so that the engine is perfectly horizontal.
- Switch off the engine and remove the ignition key from the ignition.
- Allow the engine to cool down for approximately 15 minutes.
- Turn the right safety guard up (read Appendix A-P1; p.78)
- Take a clean cloth.
- A dipstick to measure the oil level, is located at the rear of the engine. (For correct location, see the engine manual.)
- Remove the dipstick and clean it with some tissue. Reinsert the dipstick in the crankcase and then remove it again. The oil level must reach the level of the markings.
- If not, top up (note: do not overfill).



11.4.1.2 Topping up the oil

- A large fill opening has been provided in the valve cover at the top of the engine for topping up the oil. You can unscrew the filler cap manually.
- Since the location of the filling operation is not easily accessible, use a filler hose or a modified funnel to avoid spilling oil.
- Always clean the funnel before you pour the oil.
- Remove the filler cap and remove the dipstick so that the crankcase is ventilated.
- Only use the recommended oil. (See the reference list at the back of this manual.)
- Repeat measuring the oil level while topping up to avoid overfilling.



Caution:

Take into account that it will take some time for the oil to flow into the crankcase. We recommend topping up in phases with a small time interval so that the check with the dipstick can supply the correct oil level.

- Immediately clean away any spilled oil.



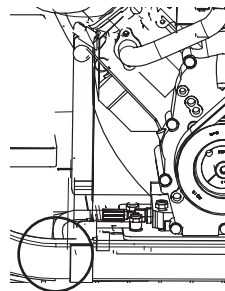
Caution:

Short of engine oil can cause irrevocable serious damage to the engine. (Such failure is not covered by the Guarantee, read Appendix F for the guarantee conditions p. 89)

11.4.2 Engine oil change

Oil is very important to an engine; it is used for both lubrication and the cooling of the engine. It is good practice to regularly change the engine oil.

- Ensure that the engine is positioned on an even surface.
- Allow the engine to run a short while so that the oil becomes liquid and then switch it off.
- Remove the key from the ignition as a precaution.
- There is a flexible hose screwed into the engine bed plate at the front of the engine. There is a removable plug at the end. (read § 11.4.3; p.52)



Warning:

Short of engine oil can cause irrevocable serious damage to the engine. (Such failure is not covered by the guarantee, read Appendix F for the guarantee conditions p.89)

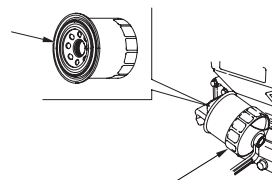
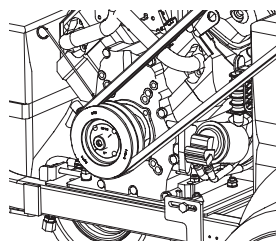
Consider the environment: Take the oil to an authorised collection point that guarantees the expert processing or recycling of oil. Never pour the oil in a sewer drain.

11.4.3 Changing the oil filter

Also change the oil filter with every second oil change. (Frequency: every 100 hours).

- The oil filter is located on the side of the engine near the hydraulic oil tank.
- First drain all the oil (read § 11.4.3; p.52).
- Hold the receptacle underneath the filter (the residue oil that remains in the filter will be no more than 0.3 l).
- Next, unscrew the oil filter. (Anticlockwise.)

Note: This filter may be firmly screwed to the engine. There are special tools to unscrew the oil filter. Ask for more information at your authorised service centre of the engine make.



- Use original filters as prescribed by the engine make (see the engine manual). These filters can be ordered from an authorised ELIET dealer or from a service centre of the engine make.
Supplier code: B&S Vanguard 22 hp: 492932 S - Supplier code: Honda GX670: 15400-ZJ1-004
- Apply a film of new oil to the sealing gasket of the new filter.
- Screw the new filter until the seal touches the filter adapter.
- Ensure that the tension is applied by tightening the filter another turn.

- You can now again top up the engine with fresh engine oil (read § Appendix A-P1; p.78).

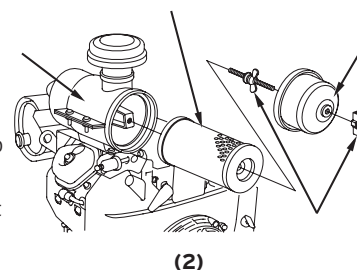
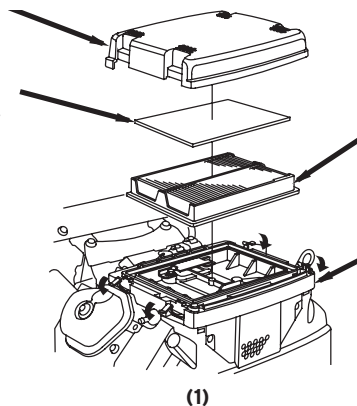
Consider the environment: Take the filter to an authorised collection point that guarantees the expert processing or recycling of oil. Never pour the oil in a sewer drain.

11.4.4 Cleaning the air filter

The petrol engine has been equipped as standard with an air filter **(1)** of the engine make or has a separate Donaldson cartridge filter **(2)***. The cartridge filter is made of layered paper and the dust must be regularly removed in the interim time.

(* Depends on the machine model.)

- Open the left safety guard upwards (read Appendix A-P1; p.78)
- The air filter can be found on top of the engine under a cover **(1)** or in the chassis recess on top of the black air box for the engine **(2)**.
- Loosen the two hold-down clamps and remove the cover.
- Remove the filter element.
- Clean the cartridge by shaking off the coarse dust and blowing off the fine dust using compressed air. Always blow from the inside towards the outside.
- Also clean the filter cover and the filter housing. If required, also wipe the board where the lips of the filter cap recess so that the filter housing can be sealed correctly.
- Refit the filter element correctly and ensure it abuts tight onto the filter housing.
- Refit the cover and secure the cover using the hold-down clamps.



Caution:

The sealing cover of the Donaldson filter has a top side. This is indicated with an arrow and "UP". (See the picture above.)



Warning:

The air filter also has a suction intake. Ensure that this suction intake is always free from obstruction and is not obstructed by leaves, chippings, dust, etc.

Ignoring this issue will disrupt the optimal combustion in the engine which may lead to irrevocable damage to the exhaust catalyst.

11.4.5 Changing the air filter

These actions are almost identical to cleaning the air cleaner (read § 11.4.4; p. 53). The only difference here is that the cartridge is replaced. New air cleaners of the correct type are available from your authorised ELIET dealer or from an authorised ELIET service centre of the engine make.

Article n°:

B&S: filter : 692519 - prefilter: 692520 - Donaldson cartridge: 820263

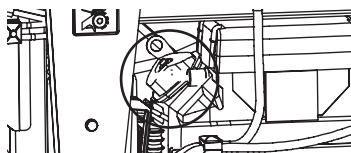
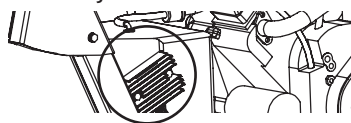
Honda: filter: 17210-ZJ1-842 - prefilter: 17218-ZJ1-840

11.4.6 Changing the fuel filter

The fuel filter can be found on the fuel line that runs from the fuel tank to the engine. The engine manufacturer recommends replacing this fuel filter on an annual basis or at least every 200 working hours.

- Switch off the engine and remove the ignition key from the ignition switch.
- If a fuel shut-off valve is available on the engine, close it.

B&S Vanguard



Honda



Warning:

Always allow the machine to cool down this is to avoid fire hazard or danger of explosion.

- The air filter holder must be uninstalled to reach the fuel filter in case of a Honda engine.
- Loosen the retaining straps and (using a universal wrench).
- Pull the filter away from the fuel line.
- Immediately clean up any petrol that leaks from the filter or the line.
- Insert the new filter (whilst taking note of the direction of the arrow marked on the filter).
- New fuel filters are available from your local Eliet dealer or from a B&S service centre of the engine make. (Order number: B&S Vanguard 691035 - Honda GX670 16910-ZEB-015)
- Retighten the straps.
- Open the fuel shut-off valve if fitted.
- Start the engine and inspect for signs of leakage.

11.4.7 Checking and replacing spark plugs

The engines available for this type of shredder are two-cylinder engines. This means that there are two spark plugs. These can be found on the cylinder head.

The spark plug is a crucial part that will also determine the correct combustion in the engine. Check the spark plug every 50 working hours.

Note: Also read the engine manual.

The prescribed spark plugs by the manufacturer of the engine are:

B&S Vanguard: CHAMPION XC92YC

Honda GX670: NGK ZGR5A

- Switch the engine off and allow it to cool for a while. Remove the key from the ignition.
- Disconnect the two spark plug caps from the spark plugs.
- Clean the area around the spark plug and remove the spark plug from the cylinder head. (A/F 13/16")
- Use feeler gauges to check whether the gap between the plug electrodes is 0.8 mm.
 - If required, carefully bend the ground electrode until the correct gap has been obtained.
- If the spark plug is wet or oil fouled, renew it.
- Replace the spark plugs every 200 working hours.



Caution:

Refitting an used or a new spark plug must be effected with great care to ensure that the cylinder head thread is not damaged.

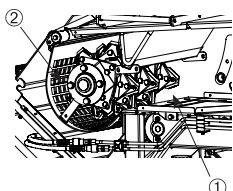
- Torque the spark plug to 20 Nm.

11.5 Maintenance of the machine

11.5.1 Routine check of the blades

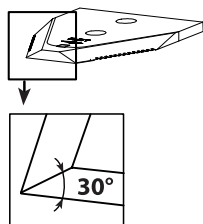
Sharp shred knives will give the machine optimum performance and provide maximum operating speed. Enhance your own work comfort by taking some time to check the blades, and if necessary, sharpen them.

SHARP BLADES = OPTIMUM PERFORMANCE



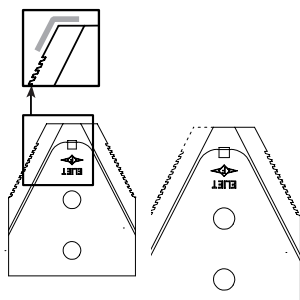
Pay particular attention to the following:

Shredding garden waste with the ELIET shredding system takes place in two steps. We first have the contact of the blades with the garden waste when chopping takes place where the cutting block can be found. The wood and green material is roughly cut into pieces until large irregular chip-pings are obtained during this **primary shredding (1)**. These large chippings end up in the shredding chamber where they are finely chopped to produce small chippings. This **secondary shredding (2)** will continue until the chippings are considered to be small enough to pass through the openings in the sieve screen.



Each of these shredding actions set certain criteria that the blades must meet for an optimal shredding efficiency:

A) The top of the blade, in particular, is important with regard to the primary shredding. Since the blades act as splitting blades, the **cutting angle** is essential because this forms the key that will cleave through the wood. The cutting angle of the cutting edge of the blade is by preference 30°. The sharper the blade edge, the less resistance when splitting and the smaller the cutting impact on the structure. This will produce significantly fewer vibrations and noise. This will also benefit the load on the blade shaft and the bearings. You can ensure that the cutting angle is the best possible at all times by regularly grinding. (read § 11.5.2; p. 57)

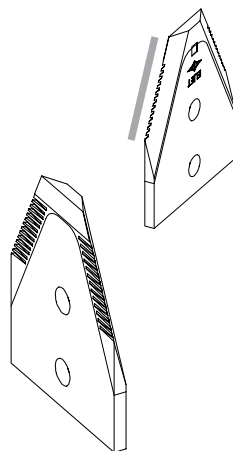


On the other hand, the form of the top of the blade is of essential importance for the performance and the speed of this primary shredding. The angle of the **top of the blade** will determine the angle at which the wood is pulled inside the shredding chamber. If this angle is rounded off due to wear, turn the blades around or replace them. (read § 11.5.3.1; p. 62)

B) The issue is to have the chippings leave the shredding chamber as quickly as possible with regard to the secondary shredding. The chippings, therefore, must be quickly reduced until they are small enough to pass through the openings of the sieve screen. Every contact with the cutting area of a blade must make the individual chipping smaller. **The sharper the full active cutting edge** of the blade, the more efficient the shredding will be. Regular grinding of the cutting edge is essential.

The teeth on the cutting edge ensures that the cutting power of the blades increases and the cutting edge remains sharp for a longer period of time. It is very important to never grind away the teeth when performing maintenance on the blades.

(read § 11.5.2; p.57)



The position of the blades on the blade shaft has been selected very specifically to obtain an alternative chopping configuration with regard to the primary shredding and the correct circulation of the chippings in the shredding chamber with regard to the secondary shredding. Always observe the original set-up of the blades when reversing or replacing them. (read § 11.5.3; p.59)

11.5.2 Sharpening the blades

Correct and timely sharpening of the shredding blades will extend their operating life (we recommend at least every 10 working hours).

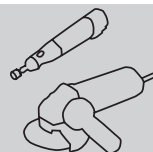
Preparatory warnings

- Always wear safety glasses and hearing protection when grinding knives. Gloves are also mandatory for performing the maintenance work.
- NEVER turn the blade shaft by grabbing the blades. Use the large pulley as a wheel to turn the rotor.
- The blade has two cutting edges (reversible blade). This means that you must take into account when sharpening that there is another razor-sharp blade side.
- Remove all wood dust and chipping residue from the shredding chamber and around the blade shaft. This to ensure fire cannot occur once glowing sharpening fillings is deposited.
- Remove the key from the ignition for your own safety.
- Open the left and right guards (read Appendix A-P1; p.78).
- Remove the discharge belt conveyor (read Appendix A-P2; p.79).
- Open the shredding chamber (read Appendix A-P3; p.80).



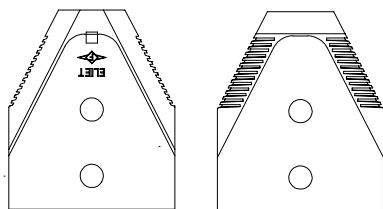
For your information:

The blades can be sharpened without having to disassemble them. Use a small angle grinder with a grinding disc suitable for steel.



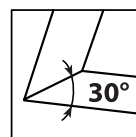
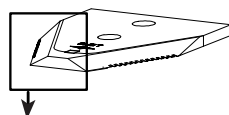
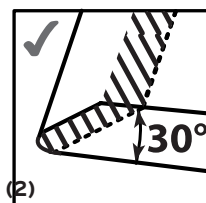
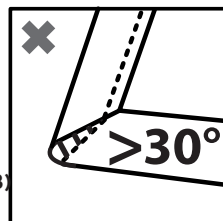
A blade has two sides.

- The front of the blade has the two chamfered cutting edges. **(F)**
- The rear clearly shows the teeth profile of the cutting area. **(B)**

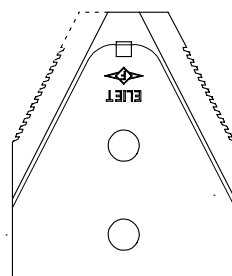
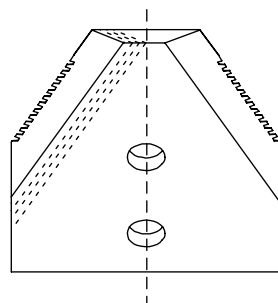
**(F)****(B)**

As described in § 11.5.1 (p. 56) Checking the blades, a sharp cutting edge and a correct cutting angle are essential for efficient shredding. These two properties of the blades are retained in position by correctly sharpening the blades.

- If blades become blunt, the sharp cutting edge will become worn and will be upset to form a wider rib. **(1)**
- By grinding a little metal from the cutting edge, you can again obtain a sharp cutting edge from this wide rib. **(2)**
- This grinding is performed by moving the grinding disc along the angled cutting edge.
- **Note:** By regularly grinding, you will only have to only grind away a small adjustment of the metal to again obtain a sharp cutting edge. This ensures that the times that you grind will be very short and will ensure that you always work with the best possible cutting edge. (ELIET recommends grinding every 10 working hours.)
- Avoid grinding at the same location for a longer period of time. Prevent local discoloration of blades; this denotes heating that causes the material structure to change locally and the hardness to decrease.
- It is extremely important that the existing cutting angle be respected when grinding. **(3: badly grinded knife)**
- If the cutting angle is not maintained, blades will be stopped in the wood due to a blunt angle **(4)** of an interrupted cutting angle **(5)** and a lot of power will be lost. A cutting angle that is too sharp **(6,7)** will weaken the cutting edge and, therefore, the blade life of the blades will be significantly shortened **(see pictures 4,5,6 and 7).**

**(1)****(2)****(3)****(4)****(5)****(6)****(7)**

- Never grind the rear side of a blade. In the case of RESIST/10™ blades, the profile is on the rear side. If you grind away the teeth, the blade will lose a great deal of its cutting force.
- The top of the knife is subjected to the heaviest loads during shredding. Sharpen this as little as possible so that it is not weakened.
- Every time you grind you remove some material and the blade will become smaller on the active cutting side. You can continue to grind until you have reached halfway through the width of the top of the blade (see picture). Should you continue to grind, you would compromise the blade life of the cutting side that has not yet been used. Turn the blades when this happens (read § 11.5.3; p.59).
- If the top of the blade is rounded-off, (see picture) the shredding efficiency will be reduced. In this event, further grinding of the blade serves no purpose. This is the time to reverse or renew the blades. (read § 11.5.3; p.59)
- After grinding, carefully close the shredding chamber, refit the discharge belt conveyor and close the safety guards. (read Appendix A-P1; p. 78)



11.5.3 Reversing and renewing the shredding knives

If blades are sharpened at regular intervals, a blade life in excess of 100 hours for each blade edge can be guaranteed. When one blade edge has reached the end of its service life, simply reverse the blade, thereby enabling the machine to operate for another 100 hours. If both blade edges are worn, replace the blade as a set.

11.5.3.1 To reverse a shredding knife, proceed as follows:



Warning:

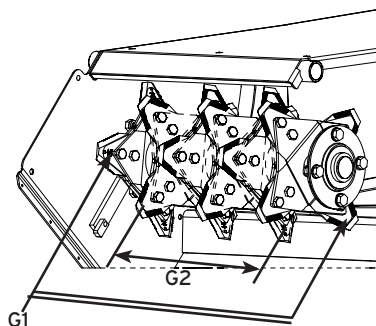
Wear protective gloves as the knives are razor sharp !

- Remove the key of the machine from the ignition.
- Fold the left and right guards up (read Appendix A-P1; p. 78).
- Fully remove the conveyor belt (read Appendix A-P2; p. 79).
- Open the shredding chamber (read Appendix A-P3; p. 80)
- Each blade is secured with two M10 bolts. Avoid injury to hands and always use two ring spanners with long handles to unscrew the bolts. (A/F 17)
- Immediately replace any damaged bolts.
- Do not pull away the blades using your hands but use a self-grip wrench.
- It is useful to put a wedge (screwdriver) in-between the blade disks to ensure it is easy to release them.

There are a few rules that must be respected for reversing or replacing the blades. The blade shaft has been divided into two groups for the logics of these rules:

Blade group 1: The two farthest blade disks belong to this group. (G1)

Blade group 2: This group contains 4 blade disks that are enclosed in-between the two farthest blade disks. (G2)



For your information:

Each blade has two sides (figure)

Front side (F): The side with the chamfered cutting edge.

Rear side (B): Side with the clearly visible teeth profile.



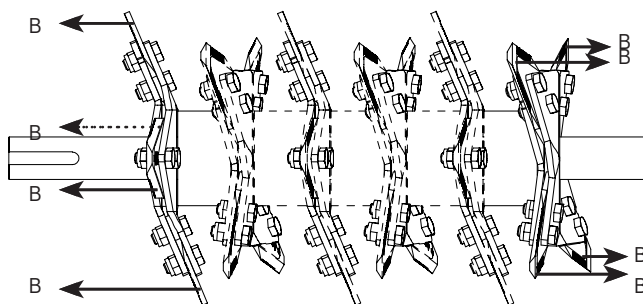
(F)



(B)

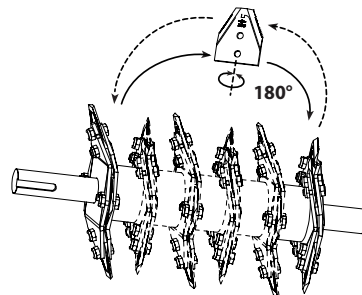
A Reversing the blades of group 1

Rule: Ensure that the blades from blade group 1 are always facing with their rear side (B) towards the side walls of the shredding chamber.



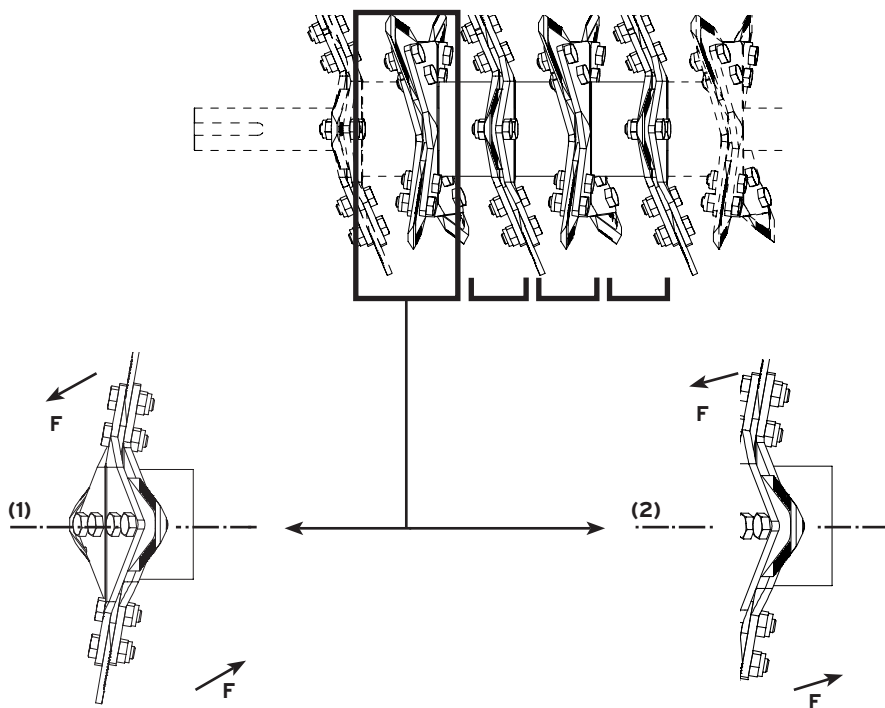
Perform the following steps to consistently apply this rule:

- Remove a knife from the left-hand side, rotate it through 180° and fit it in the same position, but to the right-hand disk. Rotate (180°) the blade previously removed from the right-hand blade disk, and fit it in the empty space in the left-hand blade disk. Repeat this procedure for each blade (8 x) of group 1.
- Always clean the blades and blade holders before reinstalling them.



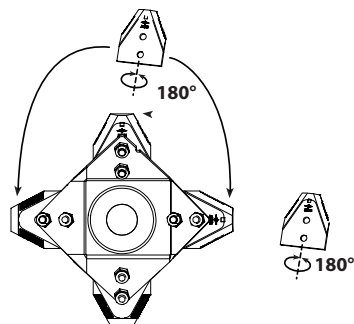
B Reversing the blades of group 2

Rule: Every blade disk has four blade positions. The blades are positioned at an angle for two positions **(1)** and the blades are approximately straight for two positions **(2)**. The front side (F) of the blade must always be directed towards the axis line of the rotor for the slanted blades. One blade will point **(F)** the front side to the right and the other will point **(F)** the front side to the left for the straight blades.



Perform the following steps to consistently apply this rule:

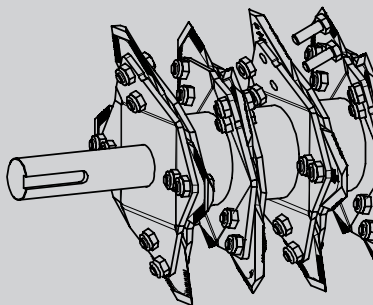
- Disassemble two blades that are diametrically opposite each other. Rotate them through 180° and change them over. Do the same with the two remaining blades. Repeat this operation for the three remaining blade disks of group 2.
- Always clean the blades and blade holders before reinstalling them.





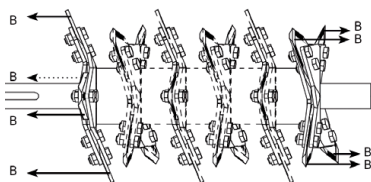
Caution:

When fitting the blades, always position the nuts on the left-hand side of the blade plate. By applying this installation method, the nuts will be automatically tightened during shredding by the turning direction of the blade shaft. As a reminder: "Always position the nuts on the belt pulley side."

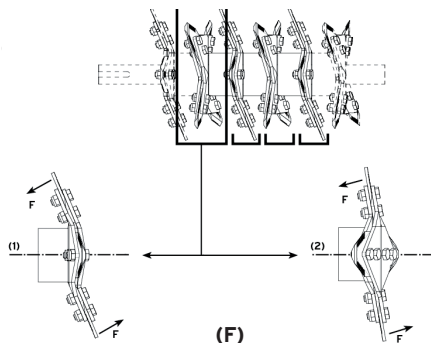


11.5.3.2 To replace a shredding knife, proceed as follows:

- New RESIST/10™ sets are available from your ELIET Dealer under the following Art. n°: BU 401 301 000
- Disassemble all bolts (M10) that secure the blades. Always use two ring spanners with long handles to unscrew these bolt attachments. (A/F 17)
- Do not pull away the blades using your hands but use a self-grip wrench.
- It is useful to put a wedge (screwdriver) in-between the blade disks to ensure it is easy to release them.
- First remove any dirt between the blade plates before you insert a new blade. To do so, use a stripping knife.
- Use the same procedure as for reversing the blade



(B)



(F)

Group 1: Check that the rear of each blade faces towards the wall **(B)** of the shredding chamber.

Group 2: Each blade that is mounted on a fluted part of a blade disk must face the axis line of the blade shaft with its front side **(F)**.

- On replacing shredding blades, always fit new bolts and nuts.
- When refitting the shredding knives check that all bolts are tight (torque loading: 76 Nm).
- When refitting the bolts in the discs, always make sure the nut is located on the left side of the disc.

As a reminder: "All nuts in the blade shaft must always be positioned along the side of the pulley".

- After reversing or replacing the blades, always check the torque of the blade bolts after the first 5 working hours and adjust, if required.

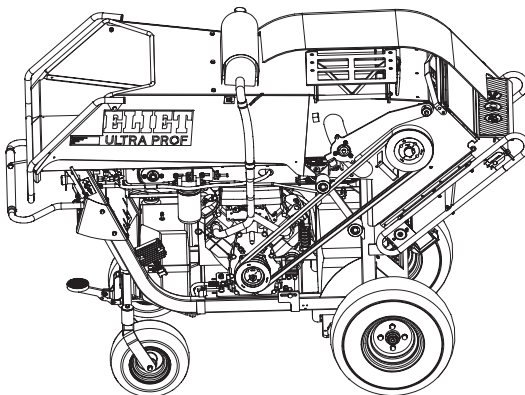


Caution:

- Incorrectly or poorly installed blades may lead to the machine breaking down or being damaged. This will also put operators and bystanders in danger.
- Not retightening the blades after the first 5 working hours after reversing or changing the blades may lead to the machine breaking down or being damaged.
- The damage and consequential damage that may arise from poor maintenance of the blades will invalidate the warranty.

11.5.4 Adjusting the drive belt tension

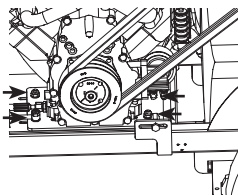
The machine is equipped with a long drive belt. The belt will show some sagging (stretching) after a certain number of working hours, which means that it will lose tension. Insufficient tension on the belt will make the belt slip when the load is heavy, which increases the wear on the belt and the service life will be reduced. A belt that is insufficiently tensioned, will flap around and, therefore, there is a risk that the belt will slip out of the pulley. Regularly check the belt for correct tension (every 50 working hours).



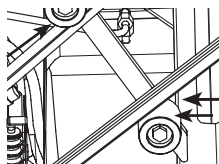
Caution:

Tension the new belt for the first time after a break-in period (run in period) of 10 working hours.

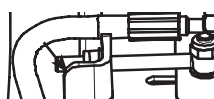
- Always switch off the engine and remove the key from the ignition as should be done for every maintenance task.
- Fold the right safety guards up for adjusting the tension. (read Appendix A-P1; p.78)



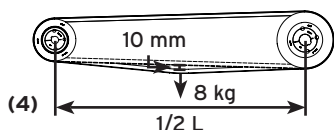
(1)



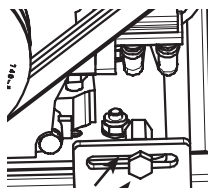
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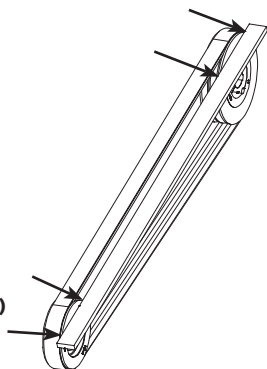
(3)



(4)



(5)



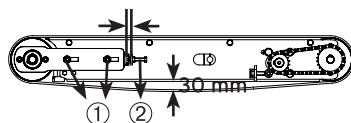
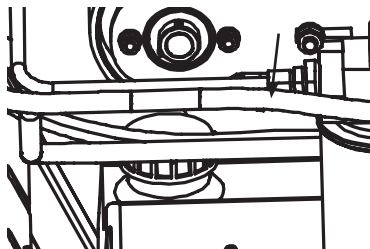
(6)

- The belt should be tensioned by sliding the engine forward using a tensioning system. Loosen the 4 securing bolts (M10) (1) of the motor bed plate. (A/F 17). The nuts do not have to be fully unscrewed, 1 turn is sufficient to remove the tension. **(1)**
- Disassemble the two support rollers so that the configuration of the belt cannot be influenced. (M10 - A/F 17). Use this opportunity to lubricate this support rollers. **(2)**
- Pull the motor bed plate forward by using an eye bolt to restore belt tension. (See figure). Tighten the nut (M10) clockwise. (A/F 17) **(3)**
- You can obtain the correct belt tension if you apply a point charge of 8 kg halfway through the distance between the centres of the pulleys and you can measure a deflection of 10 mm on the belt. **(4)**
- Once the correct tension has been achieved, align both the pulleys. To this effect, a bolt (M10) is provided. By turning this clockwise, you can pull the motor bed plate towards yourself. (A/F 17). Realign the drive pulley in this way with the pulley on the blade shaft. **(5)**
- To see whether the belt pulleys are correctly aligned, use a straight strip of wood with a sharp edge ($l = 1,200$ mm), and hold the sharp edge against both belt pulleys. When the alignment is correct, the strip of wood will touch the belt pulleys at 4 locations. **(6)**
- Once the pulleys have been correctly aligned, retighten the 4 bolts of the motor bed plate (M10 - A/F 17) (torque loading 49 Nm).
- Refit the support rollers and position these so that both have approximately 0.5 to 1 mm clearance with the belt. (M10 - A/F 17)
- Carefully close the safety guard upon completion of these maintenance tasks (see § AP.A-P1).

11.5.5 Tightening the feed belt for correct tension

Although the feed belt runs slowly and experiences little dynamic load, stretching will in due course also occur. The tension of the feed belt must, therefore, also be regularly adjusted (every 200 working hours.)

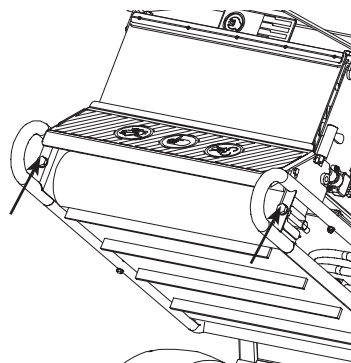
- Always switch off the engine and remove the key from the ignition before performing maintenance tasks.
- Open both safety guards to get access to the feed belt adjustment arrangements (read Appendix A-P1; p.78).
- There are two tensioning guides (one to every side) on the front roller each secured with two M10 bolts.
- Turn these four nuts **(1)** a little bit to remove the tension on the guide plate. (A/F 17.)
- A bolt presses against the tensioning guide. **(2)** This can be used to variably adjust it. Loosen the lock nut (M8) and turn the pressure bolt (M8) clockwise so that the guide roller presses forwards and the belt is uniformly tensioned. (A/F 13)
- Carry this out uniformly on both sides so that the roller will not take up a slanted position.
- If the conveyor belt can be pulled away 30 mm at the bottom of the body, then tension is correct.
- Measure the distance from the rear of the guide plate to the support block of the pressure bolt on both sides. (see drawing). Turn the pressure bolts further until this distance is the same on both sides.
- Correctly tighten the securing bolts (M10). (A/F 17)
- Once the bolts **(1)** have been tightened, the tension is removed from the pressure bolt **(2)** which allows you to have the bolt just touching the guide. Retighten the lock nut.
- Carefully replace all safety guards after carrying out the maintenance tasks.



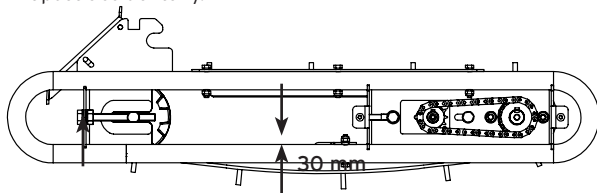
11.5.6 Tightening the discharge belt for correct tension

The discharge belt conveyor will be subjected to sagging (stretching) after a number of working hours. The tension of the belt must be adjusted to ensure the drive roller cannot slip and damage the belt.

- Always switch off the engine and remove the key from the ignition before performing maintenance tasks.
- Open both safety guards to get access to the feed belt adjustment arrangements (read Appendix A-P1; p. 78).
- The central shaft around which the top roller runs has been provided with a tensioning device on both sides. To retension the belt, pull the roller up using two adjustment bolts (M8).
- First loosen the lock nut (M8) (A/F 13) and next turn the adjustment bolt clockwise.



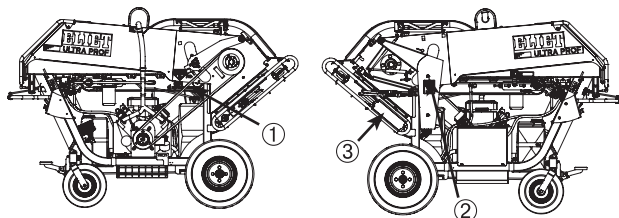
- The belt will have the required tension if you can only pull it by 30 mm halfway between the two rollers.
- Measure the distance from the roller shaft to the adjustment bolt support on both sides to ensure it is the same so that the roller runs straight. If this is not the case, adjust the adjustment bolts.
- Tighten the lock nut (M10) (A/F 13) to the correct torque so that the adjustment bolt cannot upset accidentally.



11.5.7 Adjusting the tension of the chain drives

The machine comes supplied with 3 chain drives:

- Feed belt chain drive **(1)**
- Feed roller chain drive **(2)**
- Discharge belt conveyor chain drive **(3)**



Caution:

Do not tension the chain as tightly as a belt. The drive would demand too much power and additional wear would result on the chain and chain wheels. In addition, a high radial tension will have a detrimental effect on the seals and bearings.

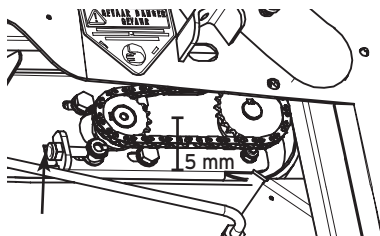
Note: Also determine the wear on the chain and chain wheel when checking the chain tension. Should the teeth have been seriously worn, replace the chain wheels and also the chain. Visit your authorised ELIET distribution center.

Note: Use this opportunity to lubricate the chain. (read Appendix B; p.83)

11.5.7.1 Checking and adjusting the tension of the feed belt drive chain

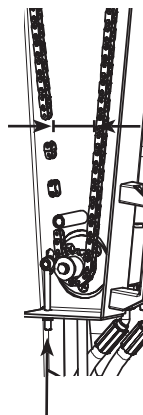
- Switch off the engine and remove the ignition key from the ignition to carry out this maintenance task.
- Open the right safety guard. (read Appendix A; p.78)
- This gives you complete access to the chain drive.
- If you can clearly see that the chain sags at the bottom, it must be tensioned.
- First, loosen the 3 bolts and 1 nut (M8) securing the hydromotor by one turn, to adjust the tension of the chain (A/F 13).
- Turning the nut (M8) of the eye bolt counterclockwise will cause the hydromotor to shift and restore chain tension (A/F 13).

- If you can move the chain up and down in the centre between the two chain wheels between 5 and 10 mm, the tension is OK.
- If the correct tension has been achieved, retighten the securing bolts. (A/F 13)
- Carefully close the right safety guard.



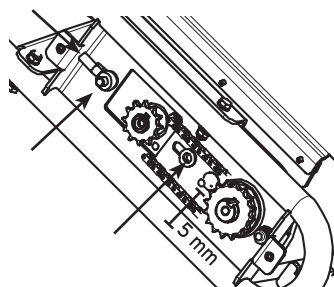
11.5.7.2 Checking and adjusting the tension of the feed roller drive chain

- Switch off the engine and remove the ignition key from the ignition to carry out this maintenance task.
- Open the left safety guard. (read Appendix A-P1; p.78)
- The chain drive can be found in the supporting arm of the feed roller. Open the cover to gain access to the chain. (read Appendix A-P5; p.82)
- If you can move the chain approximately 30 mm to and from, then it needs tensioning.
- Loosen the two securing bolts (M8) that serve to retain the hydromotor. (Loosen the left bolt and right nut 1 turn) (A/F 13).
- Tension the chain by tightening the nut (M6) clockwise on the threaded rod. (A/F 10)
- If you press the chain in the centre between the two chain wheels towards the working and slack strands and you measure a distance between them of 55 mm the tension has been correctly adjusted.
- Retighten the securing bolts (M8) (A/F 13).
- Replace the safety cover and close the large safety guard. (read Appendix A-P1; p.78 & Appendix A-P5; p.82)



11.5.7.3 Checking and adjusting the tension of the discharge belt drive chain

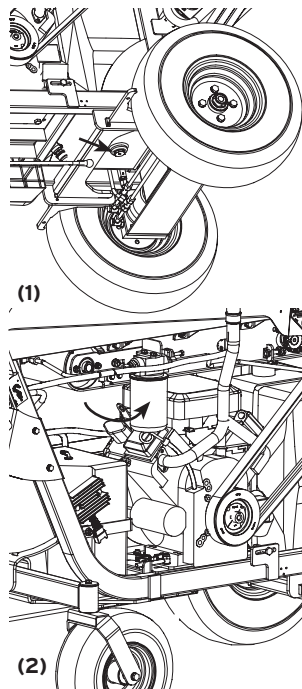
- Switch off the engine and remove the ignition key from the ignition to carry out this maintenance task.
- Open the left safety guard. (read Appendix A-P1; p.78)
- Remove the cover. (read Appendix A-P5; p. 82)
- If you notice that the chain sags, it should be tensioned.
- The drive hydromotor is screwed on to a guide plate with 3 bolts (M6). This plate, in turn, has been screwed down on to the side frame of the discharge conveyor with two bolts (M8). Loosen these two bolts one turn (A/F 13). (Figure)
- By turning the nut (M8) on the eye bolt clockwise, you can slide the guide plate which restores chain tension.
- Chain tension is correct if you can only move it to and from over a distance of 5 mm.
- Retension the guide plate using the two bolts (M8).
- Replace the safety cover and close the large safety guard. (read Appendix A-P1; p.78)



11.5.8 Replacing the hydraulic oil and the oil filter

Although the hydraulic system has a closed circuit, oil will be contaminated in due course. This dirt will be continuously filtered away by an hydraulic filter. The fouling of this filter will reduce the flow of oil and, therefore, cavity may occur. We, therefore, recommend replacing the oil and the filter every 400 working hours.

- Fold away the large safety guard to the left of the machine to quickly access all involved parts (read Appendix A-P1; p.78).
- Find the drain plug at the bottom of the large tank (30L). **(1)**
- Place a receptacle that can hold 40 L under the drain plug and loosen it. (A/F 19)
- After the 30 L oil has drained away from the tank, screw the plug back and clean up all spilled oil.
- Loosen the hydraulic oil filter (2). A specific tool can be used for this. authorised ELIET dealer. **(2)**
- Always place a tray under the filter (2 L) because when you unscrew items, oil may flow.
- Apply a film of new oil to the seal of the new filter.
- Turn the filter manually until the seal touches the seat of the filter housing.
- Tension the filter by turning it another 1/3 turn.
- Top up the tank by using new hydraulic oil. (capacity: \pm 30 l.)
- Use oil that has a viscosity degree of 46 (see the reference list in the appendix).
- Clean up any spilled oil. (read Appendix B; p.83)
- Carefully close the safety guard upon completion of this maintenance (read Appendix A-P1; p.78).

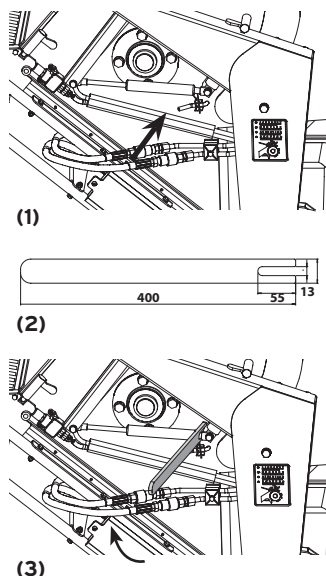


Note: Check whether there are any leads during the hours and days after performing these maintenance tasks. If required, tighten the drain plug a bit extra.

Consider the environment: Take the oil and filter to an authorised collection point that guarantees the expert processing or recycling of oil. Never pour the oil in a sewer drain.

11.5.9 Replacing the gas spring

- A 500 N gas spring presses against the left arm of the feed roller. This gas spring is important because it will ensure that the feed roller is pressed against the green waste. This will ensure that the teeth have the best possible grip on the wood. This gas spring will lose pressure in due course and it should be replaced. **(1)**
- To quickly replace the gas spring, we recommend using a lever as indicated in the drawing below. **(2)**
- Position the fork of the lever across the attachment point of the gas spring with the frame. Next, pull the lever towards you and ensure the tension is maintained. **(3)**
- Next, remove the securing bolt (M8) (A/F 13)
- Now, move the lever backwards, which will release the tension on the gas spring until it is fully extended.
- Remove the gas spring from the arm. (A/F 13) Gas springs are available from an authorised ELIET dealer with Art. n° BV 521 010 001
- Refit the new gas spring using a reverse sequence to that given for removal.
- Always install the piston rod on the arm and the piston body on the frame.



It is extremely important that you ensure there is a correct alignment when installing a new gas spring. If you notice that the gas spring is not installed aplomb, fit a few spacers where it is secured to the frame. Failure to do so, will cause the seal to be under additional pressure and promote leakage. You will have to again replace the gas spring fairly quickly.



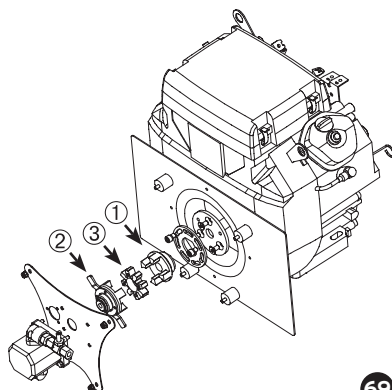
Caution:

Always ensure that the gas spring cannot slide away when retracting. The 500 N force is sufficient to break bones or cause serious bruising. Be careful.

11.5.10 Replacing the elastic coupling

An elastic coupling has been used for vibration-free transmission and a minimum pressure on the bearings of engine and hydro pump. This coupling consists of three components:

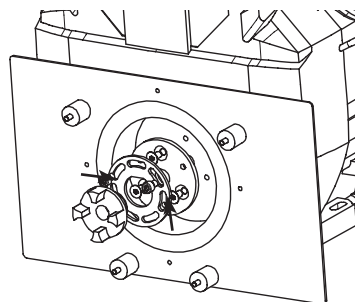
- Aluminium coupling assembly to the side of the petrol engine (Art. n° BA 201 232 001) **(1)**
- Aluminium coupling assembly to the side of the pump (Art. n° BA 201 220 101) **(2)**
- Rubber flector (elastic segment) (Art. n° BA 201 240 000) **(3)**



The three components slide into each other with relatively minimal clearance. The components will wear in due course and, therefore, play will increase. Avoid undue free play because this will cause unwanted vibrations and, moreover, this will weaken the components and, thus, the risk of a breakage will be greater. Regularly check the condition of the elastic coupling and, if excessive wear has occurred, replace it.

Spare parts are available from an authorized ELIET dealer by using the above order numbers.

- Switch off the engine and remove the key from the ignition to carry out this maintenance task.
- Open the left shielding panel (read Appendix A-PI; p.78).
- Remove the black air box. Undo the 4 M6 bolts (M6) securing this box. (A/F 10) Disconnect, if appropriate, the hydraulic lines and the air filter located on top of the air box.
- The hydraulic pump is fixed on a bed plate that, in turn, is secured to the engine using 4 rubber vibration absorbers.
- Remove the bed plate by undoing the 4 nuts (M6 - A/F 10).
- Disconnect the aluminium coupling assembly from the pump shaft. Fold the sealing lips and loosen the nut (A/F 11). The shaft is conical which makes coupling assembly removal very easy.
- When fitting the new coupling assembly, keep the small key in mind to ensure it is fitted correctly.
- A base accommodating two wings is secured to the coupling assembly. This is important to the speed sensor that is also fixed to the pump bed plate.
- For correct speed detection, it is essential that the distance when the nearest wing passes past the sensor face is 6 mm. Measure this distance accurately and, if required, adjust the sensor slightly.
- Loosen the large check nut to adjust the sensor (A/F size 36). The full length of the sensor body is threaded so that you can turn it in or out the sensor according to the required adjustment.
- The coupling assembly of the petrol engine is screw fixed to the crankshaft. The round base with oblong slots behind the coupling assembly should be used to secure it in position. Loosen the two bolts of this locking base (M6 - hex A/F 6) first and then loosen the coupling assembly. When fitting the new coupling assembly, first tighten it completely down before securing the bolts in the locking base.
- Insert the flector in between the two coupling assemblies and refit the engine bed plate in its original position. Avoid any strain on the coupling when refitting. This will prevent premature wear to the coupling parts.
- When replacing the air box, make sure to fix the box as close as possible to the engine and the hydraulic lines to minimise the risk of air gaps. This will ensure that fresh cooling air cannot mix too much with hot air that may be suctioned along these gaps.
- On refitting the hydraulic lines and/or the air filter to the air box, ensure that everything is fixed without creating stresses and strains before doing the final tightening.
- Do not omit to carefully refit and close the shielding panel upon completion of servicing.



11.5.11 Checking the tyres for correct pressure

It is important that the tyres have sufficient pressure for the safety of the operator whilst driving and also for the safety of third parties during transport. Too little pressure in the tyres will lead to an unstable driving behaviour and there will be an increased risk of tilting. The parking brake has, moreover, been pressed against the rear tyres. The clamping force of the parking brake will be inadequate when the tyre pressure is lower than normal, which may be a source of hazards.

Correct tyre tension is:

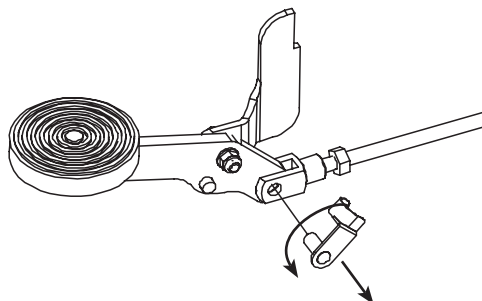
Small front tyres: 2.5 kg/cm² (Max. 40 psi)

Large rear tyres: 3 kg/cm² (Max. 50 psi)

11.5.12 Adjusting the parking brake

Always apply the parking brake when shredding to avoid that the machine should unintentionally move. In addition, it should be noted that it is essential that the parking brake holds the machine in its position for the stability of the load when transporting the machine in a van or a trailer.

A plate is pressed against the rear tyres when the brake pedal is applied at the front of the machine. The pressure that is exerted on the tyres must be sufficient to conquer the hydraulic tensile force of the wheel motors should you activate it. If the tyre diameter should have been reduced because the tyres are worn, adjust the brake accordingly. You can make adjustments to the push rod on the brake pedal.



Loosen the lock nut (M12) at the threaded end of the push rod near the brake pedal. (A/F 19)
Loosen the pin from the fork to the brake pedal. Now turn the fork one or multiple turns outwards (anticlockwise). Position the pin again in the fork and try the braking force.

If the braking force is still insufficient, repeat the above procedure. If the braking force is sufficient, retighten the lock nut (M12) (A/F 19) and also secure the pin by pressing into place the clip on the fork.

11.6 General lubrication

In view of the fact that the shredders often operate in extreme conditions, ELIET considers it important to use high-quality materials. ELIET therefore recommends the use of special lubricants (from the assembly stage onwards). (read Appendix B; p.83)

The following parts require regular lubrication:

- Pivot points and friction surfaces (read § 11.6.1; p.72).
- Grease zerks (read § 11.6.2; p.73).
- Bearings (read § 11.6.2; p.73).
- Chains and gears (read § 11.6.4; p.74).



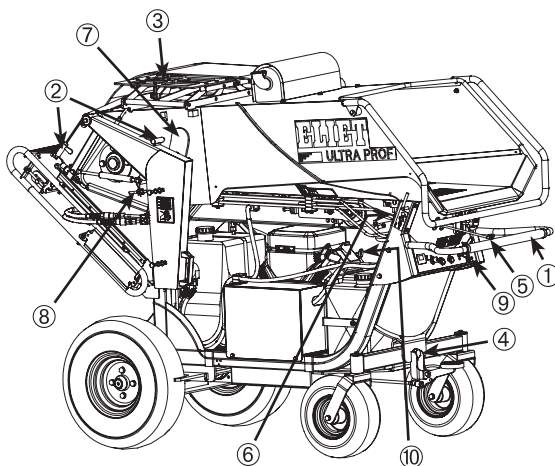
Caution:

Before performing lubrication, make sure to switch off the engine and to remove the key from the ignition switch. Gloves must also be worn during this maintenance.

11.6.1 Lubricating the pivot points

This group includes the following locations on the machine:

1. Handlebar pivot point
2. Discharge belt conveyor locking pin and feed roller arm
3. Shielding panels pivot points
4. Oscillating point of the front wheel shaft
5. Pushrod ball joints of the front wheel steering
6. Ball joints of the hydraulic valves
7. Nylon sealing plates for the feed roller guides
8. Sieve screen fixing peg
9. Throttle control lever pivot point
10. Throttle valve pivot point on the engine



Proceed as follows:

- Whenever possible, disassemble the hinge or the joint.
- Spray some penetrating oil containing molybdenum disulphide onto the friction surfaces and allow the oil to penetrate.
- Wipe away all traces of old lubricant and dirt.
- In the event of some parts not being accessible, use compressed air to remove all traces of old lubricant and dirt (e.g. in the joints of pivot points).

- When the pivot points are clean, apply new lubricant.
- ELIET recommends Novatio Clearlube as a lubricant for pivot points and ball joints. ELIET recommends Novatio PFT grease for friction surfaces.
- Wipe away any excess lubricant.

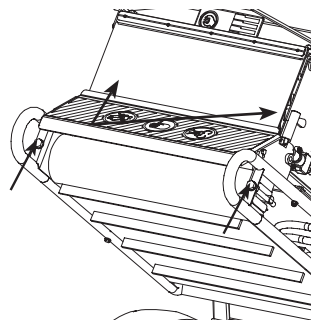
11.6.2 Greasing via the grease zerks fitted

This group includes the following locations on the machine:

- Grease zerks for the shaft of the feed roller arms

Proceed as follows:

- Clean the grease zerk.
- Using a suitable grease pump, apply new grease.
- ELIET recommends Sunoco Multi Purpose Grease.
- Pumping the grease gun one or two times is sufficient to distribute the grease.
- Wipe away any grease that comes out of the joints.



Caution:

Be very careful when applying new grease into the ball bearings. The pressure that builds up may break the seals.

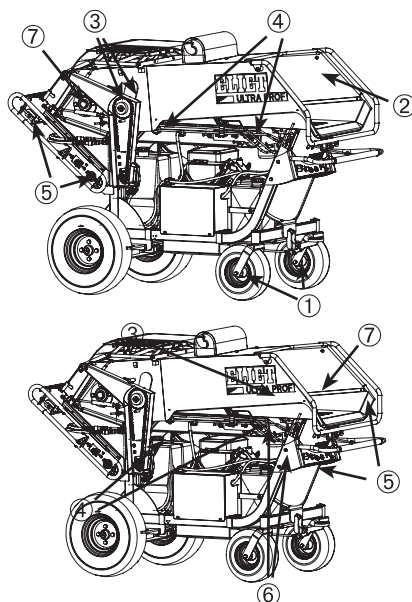
11.6.3 Lubricating the bearings

This group includes the following locations on the machine:

1. Bearings in the hub of the front wheels (4 x)
2. Bearings for the pivot point of the front wheel fork (4 x)
3. Bearings of the feed roller (3 x)
4. Bearings of the feed belt (4 x)
5. Bearings of the discharge belt conveyor (4 x)
6. Bearings of the belt support rollers (4 x)
7. Bearings of the rotor shaft

Proceed as follows:

- Spray some penetrating oil containing molybdenum disulphide (MoS_2) into the bearing and the area around and allow the oil to penetrate.
- Wipe away any external dirt.
- Spray more penetrating oil into the bearing joints.
- Allow the bearing to rotate (possibly by starting the drive that moves the bearing).





Caution:

make sure that all dangerous zones are adequately shielded)

- Once again, wipe away any dirt that is forced out by the penetrating oil.
- Use compressed air to remove all traces of penetrating oil from the bearing and from the bearing joints.
- Apply new lubricating oil. ELIET recommends Novatio ClearLube as a lubricant.
- Wipe away any excess lubricant.

11.6.4 Lubricating chains, sprockets and gear wheels

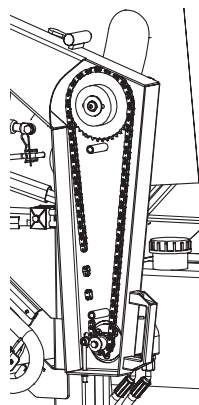
This group includes the following locations on the machine:

1. Feed roller chain drive
2. Feed belt chain drive
3. Discharge conveyor chain drive

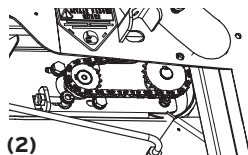
Proceed as follows:

- Remove guards and components, as necessary, to expose the drive. (read § Appendix A-P5; p.82)
- Wipe away all traces of lubricant in and around the drive.
- Use penetrating oil containing molybdenum disulphide (MoS_2) to dissolve the lubricant.
- When the drives are clean and all traces of grease and dirt have been removed, you can apply new lubricant.
- Use a small brush to apply the lubricant to the teeth of the gears. Use Sunoco Multi Purpose Grease or a product of the same quality.
- It is better to use a thin liquid lubricant that can penetrate into the chains. For this, ELIET recommends Clear Lube lubricant spray from Novatio.
- After applying the lubricant, carefully refit the components and guards in order to keep out dust and dirt as much as possible. (read § Appendix A-P5; p.82)

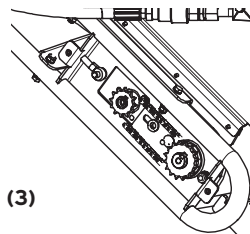
All these greases are available from your ELIET Dealer.



(1)



(2)



(3)

12 Winterizing the machine



- Clean the machine (read § 11.2.1; p.45).
- When winterizing the machine for long periods, it is recommended to perform the following steps.
- Conduct a major overhaul (read § 11.3; p.48).
- Check all nuts and bolts for correct tightness, and where necessary, retighten them.
Drain the fuel tank. The bottom of the fuel tank has a drain plug. Alternatively, use a siphoning kit to dispense the remaining fuel in the jerry can (see the safety instructions included in § 9.2; p.25).
- Repaint areas with damaged paint or cover with grease in order to prevent rust.
Original ELIET paint (RAL 2004) in the same colour is available from your ELIET Dealer.
- Store the machine in a dry place that is protected from rain, and if necessary, cover it with a tarpaulin.
- Always allow the machine to cool down before storage.
- If the machine is to be stored outside, it must be well protected with a tarpaulin.
Ensure that water does not directly fall onto the machine. At ELIET, we strongly recommend that the machine is stored at a location that is well protected from the weather, etc.
- Never store the machine for a protracted period of time in locations where the temperature will drop below 0 degrees Celsius.

13 Equipment Specifications

Engine	Honda GX 670 B&S Vanguard V-Twin
Engine starting system	Electrical
Type	Petrol
No Cylindres	2
Displacement (cc) (B&S , Honda)	627 , 670
Power kW/HP DIN (B&S, Honda)	16,2 / 22 , 17,6 / 24
Max, Torque (Nm/t/min) (B&S , Honda)	46,3 (2600) , 50,8 (2500)
Cooling	Air cooled
Fuel Tank Content	20 L Fuel
Capacity	Max Ø 140 mm
Performance (m³ chips/h)	8
Rotor	6 discs, 24 knives ELIET RESIST™/10
Cutting technology	ELIET patented Chopping Principle™
Cutting width	470 mm
Transmission (Rotor)	Beltdrive 2 V, (SPB type)
Feeding assistance	Feedroller Ø 140 mm conveyor belt 350 mm Speed governor
Power control	ELIET ABM (Anti Blocking system)
Ergonomic and safe feeding chute	Feeding height: 1000 mm Feeding opening: (H x W): 570 mm x 700 mm Anti-projection shield
Compact Design	(L x W x H) 2080 x 890 x 1410 mm
Ecological	Exhaust purifier
Reductions	CO: 87 % / HC: 90 % / Nox 85 %
Noise reduction	Designed for low soundpower profile Sound absorbing polyester cocoon Laeq: 90 dB(A)
Output system	Safe and silent conveying system Conveyor belt 500 mm Outputheight: 1100 mm
Wheeldrive	Hydraulically driven rear wheels Parking brake Progressive driving speed control Front swivel castor wheels Balancing front wheel Axle
Wheels	Drive wheels: 600 - 9 / 6 ply Front wheels: 13 x 5,00 - 6 ply
Weight	450 kg
Comfort	Designed for easy maintenance Conveyor can fold down for easy access to knives
Standard features	Hour meter - Tachometer - Maintenance Alarm
Options	EcoEye™ System (MA 020 001 001), Twin wheels (MA 020 001 002)

14 EC Declaration of Conformity



Machine: **WOOD CHIPPER**
Type: **ELIET ULTRA PROF**
Model number: **MA 020 020 213**
MA 020 020 330
MA 020 010 117
MA 020 010 213

The previously mentioned machine has been designed and manufactured to comply with the following European CE regulations :

EN 13525: Forestry machinery : wood chippers - safety

ELIET mfg. cy. hereby declares that after performing a hazard analysis, it is fully aware of the potential hazards and risks associated with the machine. In this knowledge, the necessary steps have been taken in line with Machine Directive 2006/42/EC in order to ensure absolute operator safety for the operator, when the machine is used correctly.

The value of the measured sound power level and the guaranteed sound power level were obtained according to the procedures set forward in the directive 2000/14/EG annex III/B clause 50 and directive EN 13525..

Measured sound power level L_{WA} : 114 dB(A)

Guaranteed A-weighted sound power level : 115 dB(A)

Date: 01/01/2011

Signature:

Frederic LIETAER
Managing Director ELIET EUROPE NV
Date of birth: 02/01/1975

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Appendix A (AP.A)

Procedures

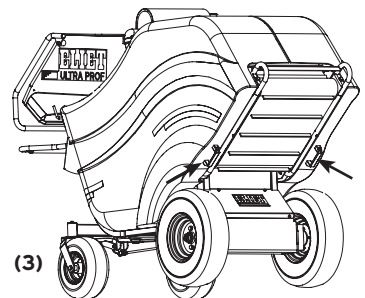
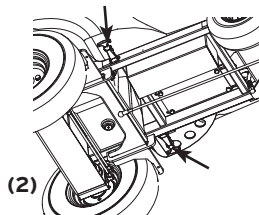
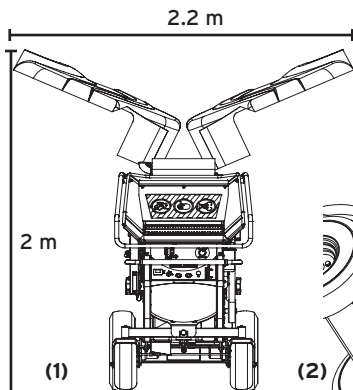
P1 Opening shielding panels



Caution:

The side panels provide protection against contact with rotating parts and danger areas. Before opening this guard, first make sure to switch off the engine and to remove the ignition key.

- The large shielding panels have a hinge on the top face of the machine. They hinge upwards like a wing. The hinged panels have a 2.2 m span, so make sure there is ample room (2 m) on either side of the machine. **(1)**
- Before siting the machine, consideration should be given that in the raised position the machine's overall height amounts to 2 m.
- After opening the L.H. shielding panel you can see the fuel tank cap of the fuel tank, the filler cap of the hydraulic oil tank, the air filter, the hydraulic pump, the feed roller drive components, the quick fit couplings of the hydraulic hoses of the discharge conveyor, the drive chain of the discharge conveyor, etc.
- On opening the R.H. shielding panel you can see the belt transmission, the exhaust pipe, belt tension setting, the feed belt drive chain, etc.
- Each shielding panel is secured in position by a guard latch. This latch is located on the underside of the guard. **(2)**
- Unsnap the rubber guard latch from the clamp.
- At the back of the machine, near the discharge conveyor, a handle is located at either end to open the shielding panel. **(3)**



**Caution:**

Use only these handles to open the shielding panels. Do not open the shielding panels by taking the bottom. The large lever effect thus created may cause the panels to crack. Cracks in the shielding panels are not covered by the warranty.

- Open the panels upwards with a swing-out action as you would with a wing door.

**Caution:**

When opening the second panel, the first panel already opened may lower some 20 cm. Keep this in mind.

**Caution:**

Never move or transport the machine with shielding panels opened.

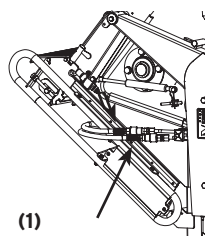
- When closing the shielding panels make sure to never let the panels come down but to support their down movement in order to achieve smooth closing against the machine.
- Take care to ensure that the hydraulic lines do not get jammed between the frame and the shielding panel.
- Make sure to retighten/refit the guard latches after closing the shielding panels. This ensures that the safety switch will not cause the engine to be switched off unintentionally.

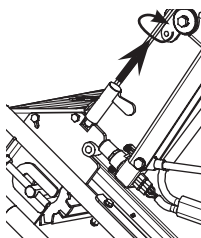
P2 Removing the discharge belt conveyor

**Caution:**

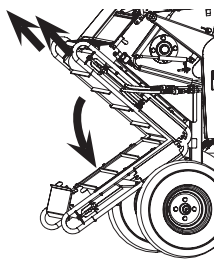
Removing the discharge belt conveyor will expose the discharge opening of the shredding chamber. So, always switch off the machine and remove the key from the ignition.

- Open the two shielding panels (read § Appendix A-P1; p.78).
- The machine has two quick disconnects fitted on the left hand side to connect the discharge belt conveyor to the hydraulic circuit. Clean the hoses and remove all dust/dirt build ups from the quick disconnects. **(1)**
- Undo the quick disconnect by sliding the knurled ring of the female coupler backward.
- Connect the two free ends of the hydraulic quick release couplings

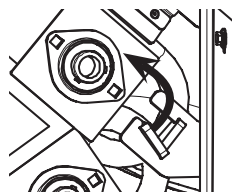




(2)



(3)



(4)

of the belt together in order to prevent damage, the ingress of dust or contamination and oil leaks.

- Unlock the lock located on the left hand-side thus allowing you to release the feed belt. **(2)**
- Grip the two bent handles with both hands and pull the discharge belt conveyor upwards at an angle in such a way that the hooks on either side unsnap from the shaft journals. **(3)**
- Next, fold the belt down until it rests on the ground.
- Alternatively, lift the pivot point away from the machine to remove the discharge belt conveyor. **(4)**
- To refit the discharge belt conveyor, use a reverse sequence to that given for removal.



Caution:

Always be sure to lock the discharge belt conveyor. This is to make sure that the discharge belt conveyor is kept pressed against a safety switch. In this way, the safety switch cannot set off accidentally, which would otherwise switch off the machine when shredding or moving.



Warning:

Never start the machine unless the discharge belt conveyor has been connected to the hydraulic circuit. Failure to observe this prohibition may seriously damage the components of the hydraulic system.

P3 Opening the shredding chamber



Warning:

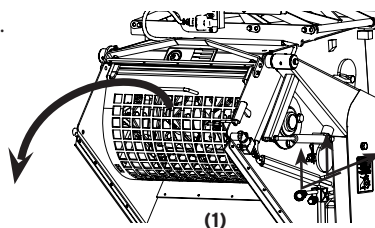
Opening the shredding chamber gives you complete access to the blade system; so always make sure to switch off the machine and to remove the key from the ignition.



Caution:

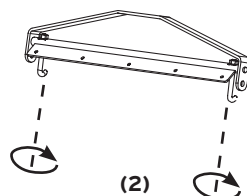
The blades are razor sharp, avoid any contact with the blades and wear suitable protective clothing (such as: heavy-duty gloves).

- Open both shielding panels (read Appendix A-P1; p.78).
- Remove the discharge belt conveyor (read Appendix A-P2; p.79).
- No tools required for opening the sieve screen, it comes with a manual quick-closing device **(1)**.
- Pull the black lever towards you to relieve the tension of the tension hooks.
- Swing the hooks away by turning the black rubber deflector in the upward direction.
- Open the sieve downwards using the handle of the sieve screen.
- To remove the sieve screen completely, simply remove the peg from the pivot point of the sieve.
- Remove the hairpin clip found on the left hand-side of the machine.
- Remove the peg using the handle.
- Prior to refitting the sieve, apply a small amount of grease to the peg for a true sliding fit in the pivot point.


Caution:

Ensure the peg is indeed inserted all the way in the hinges up to against the sieve in such a way as to avoid the peg from opening when the machine is running, which may otherwise damage the discharge belt conveyor.

- If you notice on closing the sieve that there is insufficient tension on the hooks serving to clamp shut the sieve, adjust the hooks.
- Partially unscrew the nuts from the hooks (open-ended spanner 13) and secure the hooks one turn (clockwise). **(2)**
- Close the sieve and check for adequate tension.
- If so, retighten the nuts.
- If not, turn the hooks inwards and repeat the operation above.

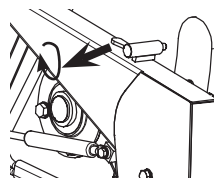

Caution:

Never run the engine with the quick disconnects disconnected from the hydraulic hoses. Failure to do so may seriously damage the hydromotors.

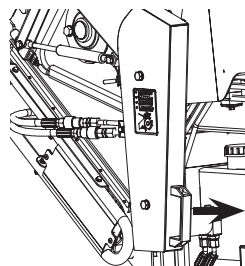
P4 Raising and locking the feed roller

To unseize a rotor after jamming or to do specific servicing (anvil replacement) it is most useful to be able to lock the feed roller in the shredding chamber in its raised position. To do so, proceed as follows:

- An arm on both sides supports the feed roller. The L.H. arm (the one with the drive components) has a latch.
- Turn the lip until the pin slides out. **(1)**
- Hold the L.H. arm at the hydromotor by the handle and lift upwards until the maximum lifting height is achieved. **(2)**
- A stop securely locks the latching pin which causes the feed roller to remain in this position.
- At that point, you can carry out the required maintenance work.
- To lower the feed roller simply release the latch. In order to prevent the feed roller from dropping down hold the L.H. arm of the feed roller whilst releasing the latch.
- Rotate the lip of the latch 180° until it engages in the small recess; this action will get the pin to retract fully to allow to lower the feed roller.
- Finally, gently lower the arm of the feed roller to its lowest position.



(1)



(2)



Caution:

The feed roller is rather heavy and a gas spring keeps it in its lowest position. When lifting, proper lifting procedures should be followed to avoid back injuries.

P5 Removing chain guards

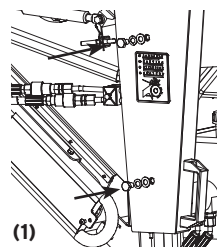


Caution:

Prior to removing a chain guard, always remember to switch off the motor and to remove the key from the ignition.

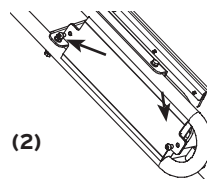
This type of shredder has three chain drive. While all of these drive arrangements are protected by large shielding panels, two of these chain drives have each their own guard for reasons of dust sealing protection:

- Feed roller chain drive: This chain drive is integral with the arm which supports the feed roller at the left-hand side. The cover is bolted down into place with two M10 bolts (A/F 17). Remember to install the lock washers when refitting the cover, to prevent the bolts from coming loose.



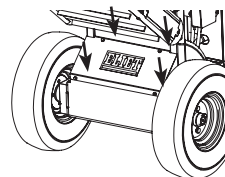
(1)

- Discharge belt conveyor chain drive: On the underside of the L.H. side of the discharge belt conveyor a black cover panel is screwed in place with two M6 bolts (hex A/F 4). The chain and sprockets used by the hydromotor to drive the bottom roll of the conveyor belt, are found behind this panel.



P6 Access to battery and wheel drive components

The battery and wheel drive hydraulic arrangement are located at the back of the machine underneath the shredding chamber. As shredding results in a lot of wood chips and significant dust production these elements are protected by a cover shield. To disconnect or top up the battery or for easy access to the hydraulic components remove the cover shield at the back of the machine.



Caution:

Removing the cover shield gives you complete access to the battery.
Wear suitable protective clothing (such as protective gloves, safety goggles).

- Always switch off the machine and remove the key from the ignition.
- The orange cover shield is retained by 4 M6 bolts.
- Release these bolts (A/F 10) and remove the cover shield.
- Clean all blockages waste chippings, remove dust and dirt before attempting any maintenance.

TIP: To remove the battery, disconnect the negative terminal (black cable) first and then the positive terminal (red cable). (A/F 13)

Appendix B

Oil	Synthetic oil for servicing CF or CF-4 SAE 10 W 30 / SAE 10 W-40 /SAE 10W-50
Content of Motor Crankcase	Without oilfilter change 1.1 L With oilfilter change 1.4 L
Fuel	Petrol 89 octane
Content Fuel Tank	20 L
Hydraulic Oil	Viscosity grade 46 cst/ High viscosity index According DIN 51524 Part 3 HVLP.VB SUNOCO Sunvis 846 WR HV

Content Hydraulic Group	30 L
Lubrication for bearings	Novatio ptfe oil
Lubrication for sprockets and chains	Novatio clear lube
Lubrication for pivot points	Novatio clear lube
Lubrication of friction surfaces	Novatio ptfe oil
Lubrication of balljoints	Novatio clear lube
Lubrication of zerk points	Sunoco multi purpose grease LR-EP2

Bolt head acc. DIN 931,912 ed.	Thread	Strength	
		8.8	10.9
Normal threadtype	M4	3,0	4,4
	M5	5,9	8,7
	M6	10	15
	M8	25	36
	M10	49	72
	M12	85	125
	M14	135	200
	M16	210	310
	M18	300	430
	M20	425	610
	M22	580	820
	M24	730	1050
	M27	1100	1550
	M30	1450	2100
Fine Threadtype	M8 x 1	27	39
	M10 x 1,25	52	76
	M12 x 1,5	89	130
	M14 x 1,5	145	215
	M16 x 1,5	225	330
	M18 x 1,5	340	485
	M20 x 1,5	475	680
	M22 x 1,5	630	900
	M24 x 2	800	1150
	M27 x 2	1150	1650
	M30 x 2	1650	2350

(applying friction factor \leftrightarrow = 0,14)

Appendix C

CLEANING	DAILY	50 HOURS	100 HOURS	200 HOURS	400 HOURS
• Clean the machine	(§ 11.3)				
• Clean the cooling system	(§ 11.3.3)				
ENGINE MAINTENANCE	DAILY	EVERY 50 HOURS	EVERY 100 HOURS	EVERY 200 HOURS	EVERY 400 HOURS
• Clean the air filter	(§11.4.4)				
• Check the oil level					
in the engine crankcase	(§11.4.1)				
• Check & change the spark plugs			(§ 11.4.7)		
• Change the air filter			(§11.4.5)		
• Change the engine oil		(§11.2.2.A)			
• Replace the oil filter				(§11.4.3)	
• Replace the fuel filter				(§11.4.6)	
MAINTENANCE OF THE MACHINE	DAILY	EVERY 50 HOURS	EVERY 100 HOURS	EVERY 200 HOURS	EVERY 400 HOURS
• Check for signs of leakage	x				
• Check the machine for signs of abnormal wear or fractures	x				
• Check the bolts for correct tightness. (Blades, wheels, bearings, engine, etc.)	x				
• Inspect the blades, and if necessary, sharpen them	(§11.5.1)				
• Check the TENSION OF THE FEED belt CONVEYOR			(§11.4.6)		
• Check the TENSION OF THE DISCHARGE belt CONVEYOR			(§11.4.7)		
• Check the chain tension and, if necessary, adjust the tension.			(§11.5.8)		
• Check the belt tension		(§ 11.5.5)			
• Reverse the RESIST™ blades			(§ 11.5.3.1)		
• Replace the RESIST™ blades				(§ 11.5.3.2)	
• Adjust the parking brake				(§11.5.12)	
• Change the hydraulic oil and oil filter					(§ 11.5.8).
• Replace the gas spring.					(§ 11.5.9)
• Replace the elastic coupling of the hydropump					(§ 11.5.10).
LUBRICATION	DAILY	EVERY 50 HOURS	EVERY 100 HOURS	EVERY 200 HOURS	EVERY 400 HOURS
• General lubrication		(§ 11.6)			

Appendix D

Hazard analysis:

Below you will find a list of dangers and risks that are linked to transporting or using the shredder. Take note of these dangers and avoid these risks by following the instructions contained in this manual. Be aware that it is not just the user who runs a risk but also third parties can be exposed to these risks. Make sure that bystanders are always kept at a safe distance.

- Injuries to hands and arms by reaching beyond the safety screen inside the feeding hopper.
- Injuries to hands and arms by reaching through the discharge opening into the shredding chamber.
- Injuries caused by chippings flying out from the feed opening because the safety screen has been lifted upwards.
- Injuries caused by chippings flying out from the discharge opening when the machine is in operation.
- Strangulation or constriction by loose clothing getting caught in moving parts.
- Glancing wounds caused by exposed parts of the discharge belt conveyor.
- Jamming/pinching of the shielding panels swinging shut.
- Accidental head-bumping when carrying out maintenance on shielding panels when hinged open.
- Burns following contact with a hot engine or hot exhaust.
- Fire hazard caused by chippings on the exhaust pipe or by faulty engine cleaning.
- Fire hazard due to spilling petrol.
- Intoxication by inhaling exhaust gases.
- Irritation of the airways or lung problems due to inhaling the dust produced.
- Jamming or constriction of limbs becoming entangled in the belt drive or chain drive due to missing safety guards.
- Hearing disorder due to insufficient protection of the ears during the work.
- Bruising or injury when feeding materials, due to the power of the blades on the wood.
- Bruising or injury due to the kick-back of wood when being introduced in the feeding hopper.
- Mental disturbance or rheumatic disorder due to shredding for a long time at a time without taking breaks.
- Injuries following contact with the blades for blockage clearance, maintenance or cleaning the machine.
- Back problems caused by lifting the machine in an irresponsible way.
- Injuries caused by the machine tipping due to unsafe transport.
- Injury due to a fall while driving on a soil that cannot support the weight of the machine.
- Knee or ankle sprain as the result of the lower limbs being caught under a wheel.
- Sprain caused by jumping off the machine on a sudden change in drive direction.
- Ankle sprain caused by the pedal kicking back when releasing the brake pedal.
- Jamming between the parking brake and the conveyor belt.

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This is not a comprehensive list and is provided for information purposes only to safeguard the safety of the user.

Appendix E

METER DISPLAY AND FUNCTIONS

Digital Display: Total Usage (hours) or Engine Speed (RPMs)

Clock: Meter is in Usage mode displaying total hours

RPM: Meter is in Tachometer mode displaying RPMs

Oil Can: Change/Check engine oil

Wrench: General maintenance (see Owner's Manual)

Filter: Change/Service air, oil, or pre-cleaner filters

Arrows: Label indicates which filter(s) need(s) servicing



METER INSTALLATION

1. Clip on the black plastic sensor over any convenient spark plug wire. Make sure the sensor is completely seated down on the spark plug wire so there is no air gap.
2. Attach the ground wire ring terminal to any convenient bare metal surface on the engine or frame. Typically an existing engine fastener can be used.
3. Route the sensor lead wire and mount the meter. CAUTION: Keep meter and wire away from EXTREMELY HOT engine surfaces or possible interference. Extra lead wire can be coiled up out of the way. See separate instructions for mounting meters with double-sided tape.
4. Attach the sensor tamper-proof lock.

NOTE: These installation steps may have already been performed by your original equipment manufacturer.

METER OPERATION

- All meter functions are controlled by pressing the Mode Button which is located on the lower face of the meter.
- Pressing the Mode Button at any time switches back and forth between Usage mode and Tachometer mode. Some meters are configured to stay in a single mode and do not switch.
- Pressing and holding the Mode Button for four (4) seconds clears flashing Maintenance Alert Icons.

USAGE METER MODE

- The meter automatically senses whenever the engine is running and keeps track of the actual total accumulated hours of operation. The clock icon flashes at one second intervals to indicate the meter is counting in Usage Mode.
- Total time is displayed in hours and tenths of an hour. Every six (6) minutes the smaller tenths digit increments.
- Total engine usage always accumulates regardless whether the meter is in Tachometer Mode or Maintenance Alert Icons are flashing.
- After 9999.9 hours the meter restarts back at 0.0 hours.

TACHOMETER METER MODE

- Current engine speed is displayed in revolutions per minute (RPM) in increments of 20 RPM.

The RPM icon stays on to indicate the meter is in Tachometer Mode.

- RPMs up to 9999 are displayed on the four large digits. If RPMs exceed 10000 the smaller far right hand digit is also used.
- Meters automatically switch from Tachometer Mode to Usage Mode when the engine is stopped and RPMs drop to zero.

MAINTENANCE ALERT ICONS

- The meter is programmed based on the recommended maintenance schedule of your engine and implement manufacturers. Check your Owner's Manual(s) for additional detailed maintenance information. A table is provided on the next page to record your maintenance events.
- Maintenance Alert Icons flash when servicing is due, regardless of the mode the meter is in, Usage or Tachometer. After maintenance is completed, reset the flashing icons by PRESSING and HOLDING the Mode Button until the icon clears (takes approximately four (4) seconds).
- **FIRST ALERT:** Servicing your new engine after the initial break-in is crucial. When a new engine has been broken-in **ALL ICONS FLASH** on the meter. Perform the maintenance specified in your Owner's Manual.
- The Oil Can Icon indicates servicing is required on the crank case oil. The Wrench Icon indicates general maintenance is required as prescribed in the Owner's Manual.
- The Filter Icon is used in conjunction with arrows pointing to "AIR", "OIL", and/or "PRE" printed on the meter label to indicate servicing is required on the air filter, oil filter or air pre-cleaner. The arrows may point to other engine or implement maintenance events printed on the label.
- Following the manufacturer's recommended maintenance schedule extends the performance, longevity and environmental compliance of the engine.

Dear Customer,

We thank you for purchasing an ELIET product. Congratulations on your choice of this machine which is sure to meet your expectations and needs over the coming years. At ELIET, we are committed to guaranteeing the correct functioning of our products. That's why you can rely on ELIET's 2-year warranty after purchase.

What is warranty ?

ELIET's product design and manufacture procedures are subject to strict quality guidelines. These are aimed at guaranteeing a long service life and permanent safety. To ensure this, ELIET will repair any hidden faults or abnormalities free of charge throughout the break-in period (the warranty period), provided the prescribed procedure is followed.

Warranty conditions

ELIET's warranty obligation for new machines is governed by the following conditions:

I. Warranty period

The warranty period shall start on the date when the Eliet dealer delivers the machine to the customer (maximum 1 week after the machine was delivered to the dealer) and shall expire:

- after two years in domestic use
- after twelve months or 100 running hours for rental use
- after twelve months or 100 running hours in semi-professional or in professional use

Customers who wish to benefit from this warranty, must register their purchase by returning the filled in registration form to Eliet Europe. From September 2008, they must register their purchase online at www.eliet.eu

II. What's excluded from this warranty ?

- Wear items are not covered by the warranty conditions: (e.g. blades, bearings, belts, chains, gearwheels, tyres, bulbs, fuses, etc).
- If failures are found to be caused by improper use, neglect or consequential damages by an external source (fall, chippings, foreign objects, accident).
- When the failure is found to be caused by failure to maintain the machine in accordance with the prescribed periodic maintenance.
- If a defect develops after service completed by anyone other than an authorized ELIET dealer or after using not genuine ELIET service parts.
- If the defect is a result of the unauthorised modification of the machine's original design.
- If the failure occurs when the machine is used in a way other than as recommended by the instructions specified in the manual.
- If the prescribed warranty procedure has not been adhered to or when the warranty period has expired.
- For problems with the engine, contact a factory authorized service station of the engine make.

III. Procedure

- **Step 1:** The enclosed registration cards should be completely filled out at the moment of purchase. The first form should be returned to ELIET within one month. The customer shall retain all other copies and the purchase invoice until the warranty expires. The customer shall register the purchase at **www.eliety.eu** (active from September 2008).
- **Step 2:** In the event of a defect becoming apparent, the customer shall have this verified by his/her authorized ELIET dealer. If the dealer feels that there is a factory defect, this dealer may invoke the warranty, under the terms specified.
- **Step 3:** Every warranty claim shall be accompanied by a fully completed official application form. Dealers can request these forms from ELIET or the ELIET import agent.
- **Step 4:** The dealer orders the parts needed to perform the repairs. The dealer then faxes the order form together with the completed warranty form and a copy of the registration card.
- **Step 5:** The warranty form should be stapled to the purchase invoice and sent to ELIET or the ELIET import agent.
- **Step 6:** ELIET shall send the ordered parts to the dealer under normal delivery and payment conditions
- **Step 7:** ELIET Technical Service Department shall examine the faulty component before accepting or rejecting any warranty claim. ELIET shall retain the right to decide whether the customer has complied with the conditions governing the validity of this one-year or two-year warranty. Faulty components shall become the property of ELIET.
- **Step 8:** If a warranty claim is found to be valid, ELIET shall credit the warranty parts. Labour costs of repair shall never be refunded.

IV. In case of damage caused by transport

- Goods are supplied ex-works. The transport risks shall be borne by the customer. Therefore, Eliet stresses the importance of examining the goods at the time of delivery.
- Any damage should be stated on the delivery form before it is signed. Have the driver add a signature alongside this statement on your copy.
- In the absence of this written, signed statement on the delivery form the transport insurance will not accept any liability.
- Damages may be claimed from the hauler using a copy of the delivery form and a covering letter stating your complaint.
- The machine should be kept in its original condition until the hauler's insurer has examined it.

REGISTRATIONCARD ELIET CUSTOMER SERVICE

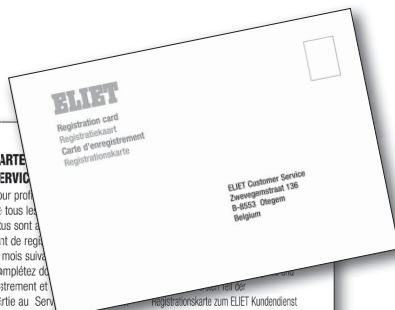
To be able to claim the full rights to which you are entitled, it is important to register within a month after the date of purchase. Therefore fill out this registration form and return the first registration card to the ELIET Customer Service. Your purchase should be registered on the ELIET website: www.eli-et.be

REGISTRATIEKAART ELIET KLANTDIENST

Om als klant, aanspraak te kunnen maken op waarborg dient men zich binnen de maand na aankoop bij ELIET te registreren. Hiervoor vult u onderstaand document volledig in en stuurt het eerste deel van deze registratiekaart naar de ELIET klantendienst terug. Registreer uw aankoop op de ELIET website: www.eli-et.be

CARTE SERVICE

Pour profiter de tous les avantages auxquels vous êtes éligible, il est important de vous inscrire dans le mois suivant l'achat. Complétez donc ce formulaire et renvoyez la première partie au Service Clientèle ELIET. Enregistrez votre achat sur le site Internet ELIET: www.eli-et.be



ELIET Customer Service
Zwevegemstraat 136
9-6003 Oergem
Belgium

Customer Identity / Klantgegevens / Données du Client / Kundendaten

Name / Naam / Nom / Name		First Name / Voornaam / Prénom / Vorname	
Street / Straat / Rue / Strasse		Nr / Nr / N° / Nr	
City code / Postnr / Code Postal / Postleitzahl		Box / Bus / Boite / App.	
City / Plaats / Ville / Stadt		Country / Land / Pays / Land	
Telephone / Telefoon / Téléphone / Telefon-Nr.		Fax / Fax / Télécopieur / Fax	
E-mail			

Machine Identity / Machinegegevens / Données de machine / Daten Maschine

Model / Model / Modèle / Modell		Year of manufacture / Bouwjaar / L'année de construction / Baujahr	
Article Code / Artikel code / Code d'article / Artikel-Nr.		Serialnumber / Seriennummer / Numéro de série / Serien-Nr.	
Date / Datum / Date / Datum			
Signature Handtekening Signature Unterschrift		Stamp of dealer Stempel van handelaar Cachet de revendeur Stempel Fachhändler	

I declare that all information that was filled in is correct and truthful. I also declare to have read and understood the operation manual and the warranty conditions.
Ik verklaar dat al deze gegevens waarheidsgetrouw werden ingevuld. Hierdoor geef ik te kennen de gebruiksaanwijzing en de garantievoorwaarden te hebben gelezen en begrepen.
Je déclare que tous les données complétées sont correctes et véridiques. Je déclare également d'avoir lu et compris les notices du mode d'emploi et les conditions de garantie.
Ich erkläre hiermit, dass alle angegebenen Daten korrekt und wahrheitsgemäß gemacht wurden. Ich erkläre ebenso, dass ich die Garantiebedingungen gelesen und verstanden habe.

Put a crossmark to which application this machine was used
Zet een kruis bij de toepassing waarbij deze machine wordt ingezet
Indiquez avec une croix l'environnement dans lequel la machine a été utilisée.
Kreuzen Sie an, für welche Art von Gebrauch die Maschine bestimmt ist.

- ☐ Home use / Particulier gebruik / Usage particulier / Private Nutzung
☐ Professional Landscaping / Hoveniersbedrijf / Usage Professionnel / Gewerbliche Nutzung
☐ Forestry / Bosbouw / Forêt / Forstbetrieb
☐ Public Grounds care / Openbare groenvoorziening / Espaces Verts Public / Öffentliche Grünflächenversorgung
☐ Rental / Verhuur / Location / Vermietung

**Dit document dient binnen de maand na aankoop teruggestuurd te worden naar de ELIET Klantendienst.
This document has to be returned to ELIET Customer Service within a month after purchase.
Renvoyez ce document au Service après-vente ELIET dans le mois suivant à la date d'achat.
Dieses Dokument muss innerhalb eines Monats nach Kaufdatum an den ELIET Kundendienst zurückgeschickt werden.**

Appendix G

conversion tabel

LENGTH		WEIGHT		VOLUME	
mm	inch	kg	lbs	liters	gallons
25,40	1	1,00	2,205	3,785	1
1,00	1/25	0,45	1,00	1,00	0,264
0,80	0,03	8	17,50	0,30	0,08
5,00	1/5	450	992	1,10	0,29
10,00	0,40	750	1650	1,40	0,37
30,00	1,20			2,00	0,52
55,00	2-1/16			20,00	5,28
140,00	5-1/2			30,00	7,92
350,00	13-3/4			40,00	10,57
400,00	16				
470,00	18-1/2				
500,00	19-3/4				
570,00	22-1/2				
700,00	27-1/2				
890,00	35				
1000,00	39-1/3				
1100,00	43-1/3				
1200,00	47 (4ft)				
1410,00	55-1/2				
2080,00	82(6.8ft)				
2 meters	79(6.6ft)				
2.2 meters	87(7,2ft)				
10 meters	30(33ft)				

Nm conversion to lbf/ft	
20Nm	15 lbf/ft
49Nm	37 lbf/ft
76Nm	56 lbf/ft

